Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

Printed 26.02.2020
Revision 25.02.2020 (GB) Version 11.0
R 125
0039

! SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of product	R 125 Art-Nr(n).: 0039
Name of substance	Pentafluoroethane (R 125)
EC No	206-557-8
REACH registration number	01-2119485636-25
CAS No	354-33-6

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

Identified uses

Remark
Restricted to professional users.

Uses advised against

! **Remark**
Control of use according to Article 13 (3) of Regulation (EU) No. 517/2017 (EU-F-Gas Regulation) must be followed.

Recommended intended purpose(s)
Refrigerant.

1.3. Details of the supplier of the safety data sheet

Manufacturer/distributor	GHC Gerling, Holz & Co. Handels GmbH Ruhrstraße 113, D-22761 Hamburg Phone +49 40 853 123-0, Fax +49 40 853 123-66 E-Mail hamburg@ghc.de Internet www.ghc.de
Advice	GHC Gerling, Holz & Co. Handels GmbH Phone +49 40 853 123-0 Fax +49 40 853 123-66 E-mail (competent person): msds@ghc.de

1.4. Emergency telephone number

Emergency advice	Medical Emergency information in case of poisoning: Poison Information Center Mainz -24h- Phone +49 (0) 6131 19240 (service in German or English)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
Liquef. Gas	**H280**	

Hazard statements for physical hazards

H280 **Contains gas under pressure; may explode if heated.**

2.2. Label elements
Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

GHS04

Signal word
Warning

Hazard statements for physical hazards
H280 **Contains gas under pressure; may explode if heated.**

Precautionary Statements

Storage
P403 Store in a well-ventilated place.

Hazardous ingredients for labeling
Pentafluoroethane (R 125)

Supplemental Hazard information (EU)

Health properties
Asphyxiant in high concentrations.

Environmental properties
Contains fluorinated greenhouse gases.

Special rules for supplemental label elements for certain mixtures
Withdrawal out of the liquid phase only.

2.3. Other hazards
Adverse human health effects and symptoms
Contact with liquid may cause cold burns/frostbite.
The inhalation of gas / vapour in high concentrations may cause cardiac arrhythmia.
Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.

Information pertaining to special dangers for human and environment
Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
Receptacle under pressure.

Results of PBT and vPvB assessment
This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

SECTION 3: Composition/ information on ingredients

3.1. Substances
Description
Content: > 99 %

CAS No 354-33-6 **Pentafluoroethane (R 125)**
EC No 206-557-8
REACH registration number 01-2119485636-25

Additional advice
Contains fluorinated greenhouse gases.

3.2. Mixtures
not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General information
Remove contaminated soaked clothing immediately.
In the event of persistent symptoms receive medical treatment.
Adhere to personal protective measures when giving first aid.

In case of inhalation
Remove the casualty into fresh air and keep him immobile.
Seek medical treatment immediately.
In case of respiratory standstill give artifical respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

In case of skin contact
In case of contact with skin wash off with warm water.
In case of frostbite rinse with plenty of water. Don`t remove clothing.
In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Do not remove clothing frozen to the skin. Thaw it with lukewarm water. Apply a sterile dressing. Obtain medical assistance.

In case of eye contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call for a doctor immediately.

In case of ingestion
Ingestion is not considered a potential route of exposure.

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

Physician's information / possible symptoms
The following symptoms may occur in case of strong exposition:
Unconsciousness
Cardiac arrhythmia (disordered cardiac rhythm).
Headache
Nausea
Confusion
Dizziness
Contact with liquid may cause cold burns/frostbite.

Physician's information / possible dangers
Long-term inhaling of separation products may cause pulmonary oedema.

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

Treatment (Advice to doctor)
Treat symptoms.
Do not give any preparations of the adrenalin-ephedrine group.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
Product does not burn, fire-extinguishing activities according to surrounding.
Alcohol-resistant foam
Dry powder
Carbon dioxide
Water spray jet

Unsuitable extinguishing media
Full water jet

5.2. Special hazards arising from the substance or mixture
In case of fire formation of dangerous gases possible.
Carbon monoxide (CO)
Carbon dioxide (CO2)
Hydrogen fluoride (HF)
Carbonyl fluoride.

5.3. Advice for firefighters
Special protective equipment for fire-fighters
Use breathing apparatus with independent air supply (isolated).
Wear full protective clothing.

Additional information
Cool endangered containers with water spray jet.
Exposure to fire may cause containers to rupture / explode.
Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
For non-emergency personnel
Evacuate area.
Keep people away and stay on the upwind side.

For emergency responders
Remove persons to safety.
Personal protection by wearing close-fitting protective clothing and breathing apparatus.
Pay attention to extension of gas especially at ground (heavier than air) and in direction of the wind.

6.2. Environmental precautions
If possible, stop flow of product.
Do not discharge into the drains/surface waters/groundwater.
Prevent spread over a wide area (e.g. by containment or oil barriers).
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
If necessary, secure leaky pressure receptacles in a salvage packaging.
Do not discharge into the subsoil/soil.

6.3. Methods and material for containment and cleaning up
Ensure adequate air ventilation.
Allow to vaporise.

6.4. Reference to other sections
Safe handling: see section 7
Disposal: see section 13
Personal protection equipment: see section 8

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Advice on safe handling
Use only in thoroughly ventilated areas.
Transfer and handle only in enclosed systems.
Containers' temperature may not be increased above 50 °C.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
Provide good room ventilation even at ground level (vapours are heavier than air).
Prevent cylinders from falling over.

Avoid release to the environment.
Ensure valve protection device is correctly fitted.
Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
Open valve slowly to avoid pressure shock.
Do not allow backfeed into the container.
Suck back of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.

General protective measures
Do not inhale gases.

Hygiene measures
At work do not eat, drink and smoke.
Wash hands before breaks and after work.

Advice on protection against fire and explosion
The product is not combustible.
Pay attention to general rules of internal fire prevention.

7.2. Conditions for safe storage, including any incompatibilities
Requirements for storage rooms and vessels
Keep in closed original container.
Only use containers that are approved specifically for the substance/product.
Suitable materials: Normalised carbon steel, tempered alloy steel, aluminium alloys, austenitic stainless steels.
Valve: Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, austenitic stainless steels.
Other material details see ISO 11114.
All regulations and local requirements for the storage of containers have to be respected.

Advice on storage compatibility
Do not store together with combustible materials.
Do not store together with spontaneously flammable materials.
Do not store together with animal feedstuffs.
Do not store together with explosives.
Do not store together with infectious substances.
Do not store together with radioactive material.
Do not store together with toxic liquids or toxic solids.
Do not store together with food.
Do not store together with oxidizing liquids or oxidizing solids.

Further information on storage conditions
Ensure valve protection device is correctly fitted.
Store only in original container at temperature of 50°C maximum (=122°F).
Protect from heat and direct solar radiation.
Prevent cylinders from falling over.
Keep container in a well-ventilated place

7.3. Specific end use(s)
Recommendation(s) for intended use
Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
DNEL-/PNEC-values

DNEL worker

CAS No	Substance name	Value	Code	Remark
354-33-6	Pentafluoroethane (R 125)	16444 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 7,5, repeated dose toxicity.

DNEL Consumer

CAS No	Substance name	Value	Code	Remark
354-33-6	Pentafluoroethane (R 125)	1753 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 25, repeated dose toxicity.

PNEC

CAS No	Substance name	Value	Code	Remark
354-33-6	Pentafluoroethane (R 125)	1 mg/l	PNEC aquatic, intermittent release	Assessment factor 100, assessment factor.
		0,1 mg/l	PNEC aquatic, freshwater	Assessment factor 1000, assessment factor.
		0,6 mg/kg dw	PNEC sediment, freshwater	

8.2. Exposure controls

Respiratory protection
Breathing apparatus in the event of high concentrations.
Keep self contained breathing apparatus readily available for emergency use.
Do not use any filter apparatus.
Respiratory protection complying with EN 137.
In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation by edging out of air oxygen

Hand protection
Leather gloves
Safety gloves according to EN 388

Eye protection
Protective goggles according to EN 166, in case of increased risk add protective face shield.

Other protection measures
Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk.

Appropriate engineering controls
Transfer and handle only in enclosed systems.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Colour	Odour
Gaseous / liquefied under pressure.	colourless	ethereal

Odour threshold
not determined

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not applicable				
boiling point	-48,3 °C		1013 hPa		
melting point	-103 °C				
Flash point	not applicable				
Vapourisation rate	not determined				
Flammable (solid)	not applicable				
Flammability (gas)	no				
Ignition temperature	not determined				
Self ignition temperature	not determined				
Lower explosion limit	no				
Upper explosion limit	no				
Vapour pressure	12030 hPa	20 °C			
Relative density	not determined				
Vapour density	1,21	20 °C			air = 1
Solubility in water	430 mg/l	25 °C			
Solubility/other	not determined				
Partition coefficient n-octanol/water (log P O/W)	1,34				
Decomposition temperature	not determined				
Viscosity	not applicable				

Oxidising properties
no

Explosive properties
no

9.2. Other information
Vapours are heavier than air.

SECTION 10: Stability and reactivity

10.1. Reactivity
See section "Possibility of hazardous reactions".

10.2. Chemical stability
Stable under recommended conditions of use and storage (see section 7).

10.3. Possibility of hazardous reactions
Danger of fire and explosion with strong oxidants, alkali metals and earth alkali metals.
Reactions with metals in powder form.
Reactions with metal salts in powder form.

10.4. Conditions to avoid
Heat sources / heat - risk of bursting.
Avoid contact with open flames, glowing metal surfaces, etc..

10.5. Incompatible materials
Substances to avoid
Metals in powder form.
Metallic salts in powder form.
Strong oxidizing agents.
Alkali metals.
Earth alkali metals.

10.6. Hazardous decomposition products
Carbon monoxide and carbon dioxide.
Fluorophosgene on contact open flame or glowing objects
Hydrogen fluoride
Carbonyl fluoride

Thermal decomposition

Remark No decomposition if used as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritation/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral	Study technically not feasible.			
LD50 acute dermal	Study technically not feasible.			

	Value/Validation	Species	Method	Remark
LC50 acute inhalation	> 800000 ppm (4 h)	rat (male / female)	OECD 403	
Skin irritation	Study technically not feasible.			
Eye irritation	Study technically not feasible.			
Skin sensitization	Study technically not feasible.			
Sensitization respiratory system	Study technically not feasible.			

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subacute Toxicity	NOAEL > 50000 ppm (28 d) Sub-acute inhalation toxicity 6 h/d, 5 d/w	rat (male / female)	OECD 412	No effects of toxicological significance.
Subchronic Toxicity	NOAEL > 50000 ppm (90 d) Inhalation 6 h/d, 5 d/w	Rat (male / female)	OECD 413	No effects of toxicological significance.
Mutagenicity				No experimental information on genotoxicity in vitro and in vivo available.
Reproduction-Toxicity				No indications of toxic effects were observed in reproduction studies in animals.
Carcinogenicity				not determined

Specific target organ toxicity (single exposure)
Substance or mixture is not classified in GHS-criteria as specific target organ toxic with single exposure.

Specific target organ toxicity (repeated exposure)
Substance or mixture is not classified in GHS-criteria as specific target organ toxic with repeated exposure.

Aspiration hazard
not applicable

Experiences made from practice
The inhalation of gas / vapour in high concentrations may cause cardiac sensitization (dogs).
Inhalation causes shortness of breath.
Gases have a suffocating effect.
Inhalation causes narcotic effect/intoxication.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 100 mg/l (96 h)	Oncorhynchus mykiss	OECD 203	Analogous to a similar product.
Daphnia	EC50 100 mg/l (48 h)	Daphnia magna	OECD 202	Analogous to a similar product.
Algae	EC50 114 mg/l (72 h)	Pseudokirchneriella subcapitata	OECD 201	Analogous to a similar product.

12.2. Persistence and degradability

	Elimination rate	Method of analysis	Method	Validation
Biological degradability	5 % (28 d)		OECD 301 D	not readily degradable

12.3. Bioaccumulative potential

No high bioaccumulation potential.
Because of the n-octanol/water distribution coefficient (log K o/w) accumulation in organisms is not expected.

12.4. Mobility in soil

Due to its high volatility, the product is unlikely to cause soil or water pollution.

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

GWP: 3500
ODP: 0

General regulation
Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.
Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste code No.	**Name of waste**
14 06 01*	chlorofluorocarbons, HCFC, HFC

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC on hazardous waste.

Recommendations for the product
Dispose of as hazardous waste.
Return to manufacturer.

Recommendations for packaging
Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

General information
Operators of stationary equipment shall be responsible for putting in place arrangements for the proper recovery.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	3220	3220	3220
14.2. UN proper shipping name	REFRIGERANT GAS R 125 (Pentafluoroethane (R 125))	PENTAFLUOROETHANE (Pentafluoroethane (R 125))	Refrigerant gas R 125 (Pentafluoroethane (R 125))
14.3. Transport hazard class(es)	2.2	2.2	2.2
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	No

14.6. Special precautions for user
The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable
No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID
Hazard label(s) 2.2
tunnel restriction code C/E
Special provisions 662
Classification code 2A

Marine transport IMDG
EmS: F-C, S-V

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Other regulations (EU)
Regulation (EU) No 517/2014 on fluorinated greenhouse gases.
Regulation (EU) 2015/2068 establishing, pursuant to Regulation (EU) No 517/2014, the format of labels for products and equipment containing fluorinated greenhouse gases.
Regulation (EU) 2015/2067 establishing, pursuant to Regulation (EU) No 517/2014, ~ certification ~ as regards stationary refrigeration, air conditioning and heat pump equipment, and ~ containing fluorinated greenhouse gases.

VOC standard
VOC content >=99 % 20 °C 12030 hPa

15.2. Chemical Safety Assessment
For this substance a chemical safety assessment is not required.
An exposure scenario is not required.
The protective measures listed in sections 6, 7 and 8 must be complied with.

SECTION 16: Other information

Recommended uses and restrictions
Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.
National and local regulations concerning chemicals shall be observed.

Further information
All declarations of safety-data-sheet refer to pure substance.
The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Indication of changes: "!" = Data changed compared with the previous version. Previous version: 10.0

Sources of key data used
For the preparation of this safety data sheet, information from our suppliers as well as data from the "database of registered substances" of the European Chemicals Agency (ECHA) were used.