

Fluoromethane (R41)**059****SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Trade name : Fluoromethane (R41)
SDS Nr : 059
Chemical description : Fluoromethane (R41)
CAS No : 593-53-3
EC No : 209-796-6
Index No : ---
Registration-No. : Registration deadline not expired.
Chemical formula : CH₃F

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

Relevant identified uses : Test gas / Calibration gas.
Industrial and professional. Perform risk assessment prior to use. Laboratory use.
Contact supplier for more uses information. Use as refrigerant. Chemical reaction / Synthesis.

1.3. Details of the supplier of the safety data sheet

Company identification : AIR LIQUIDE Deutschland GmbH
Hans-Günther-Sohl-Straße 5
D-40235 Düsseldorf GERMANY
Telefon: +49 (0)211 6699-0 - Fax: +49 (0)211 6699-222
E-Mail address (competent person) : Info.SDB@AirLiquide.de

1.4. Emergency telephone number

Emergency telephone number : +49 (0)2151 398668

SECTION 2. Hazards identification**2.1. Classification of the substance or mixture****Hazard Class and Category Code(s), Regulation (EC) No 1272/2008 (CLP)**

• Physical hazards : Flammable gases - Category 1 - Danger - (CLP : Flam. Gas 1) - H220
Gases under pressure - Liquefied gas - Warning - (CLP : Press. Gas) - H280

Classification EC 67/548 or EC 1999/45

Classification : F+; R12
Not included in Annex VI.

2.2. Label elements**Labelling Regulation EC 1272/2008 (CLP)**

• Hazard pictograms



• Hazard pictograms code : GHS02 - GHS04
• Signal words : Danger
• Hazard statements : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
• Precautionary statements
- Prevention : P210 - Keep away from heat, sparks, open flames or hot surfaces. – No smoking.
- Response : P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.



SAFETY DATA SHEET in accordance with REACH regulation 1907/2006/EC

Page : 2 / 9

Revised edition no : 3 - 00

Date : 31 / 1 / 2014

Supersedes : 2 / 10 / 2012

Fluoromethane (R41)**059****SECTION 2. Hazards identification (continued)**

- Storage : P403 - Store in a well-ventilated place.

2.3. Other hazards

Other hazards : Contains Fluorinated greenhouse gases covered by the Kyoto protocol.
Contact with liquid may cause cold burns/frostbite.

SECTION 3. Composition/information on ingredients**3.1. Substance / 3.2. Mixture**

Substance.

| Substance name | Content [Vol-%] | CAS No EC No Index No Registration no. | Classification(DSD) | Classification(CLP) |
|---------------------|-----------------|---|---------------------|---------------------------------------|
| Fluoromethane (R41) | : 100 % | 593-53-3 209-796-6 ----- * 2 | F+; R12 | Flam. Gas 1 (H220) Liq. Gas (H280) |

Contains no other components or impurities which will influence the classification of the product.

* 1: Listed in Annex IV / V REACH, exempted from registration.

* 2: Registration deadline not expired.

* 3: Registration not required: Substance manufactured or imported < 1t/y

Full text of R-phrases see chapter 16. Full text of H-statements see chapter 16

SECTION 4. First aid measures**4.1. Description of first aid measures**

- 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.
- Skin contact : For liquid spillage - flush with water for at least 15 minutes.
- Eye contact : For liquid spillage - flush with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

4.2. 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.

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

- : None.

Fluoromethane (R41)**059****SECTION 5. Fire-fighting measures****5.1. Extinguishing media**

- Suitable extinguishing media : Water spray or fog.
Dry powder.
- Unsuitable extinguishing media : Do not use water jet to extinguish.
Carbon dioxide.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition : Carbonyl fluoride. Carbon monoxide. Hydrogen fluoride.

5.3. Advice for firefighters

- Specific methods : Use water spray or fog to knock down fire fumes if possible.
Use fire control measures appropriate to the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
If possible, stop flow of product.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
- Special protective equipment for fire fighters : None necessary.
In confined space use self-contained breathing apparatus.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

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.
Try to stop release.
Consider the risk of potentially explosive atmospheres.
Evacuate area.
Ensure adequate air ventilation.
Eliminate ignition sources.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.2. Environmental precautions

- : Try to stop release.

6.3. Methods and material for containment and cleaning up

- : Ventilate area.

6.4. Reference to other sections

- Reference to other sections : See also sections 8 and 13.

Fluoromethane (R41)**059****SECTION 7. Handling and storage****7.1. Precautions for safe handling****Safe use of the product**

- : Consider pressure relief device(s) in gas installations.
- Only experienced and properly instructed persons should handle gases under pressure.
- The product must be handled in accordance with good industrial hygiene and safety procedures.
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Take precautionary measures against static discharge.
- Purge air from system before introducing gas.
- Keep away from ignition sources (including static discharges).
- Do not smoke while handling product.
- Assess the risk of potentially explosive atmosphere and the need for explosion-proof equipment.
- Consider the use only non-sparking tools.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.

Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions.
- Suck back of water into the container must be prevented.
- Do not allow backfeed into the container.
- Protect cylinders from physical damage; do not drag, roll, slide or drop.
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
- Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
- If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.
- Keep container valve outlets clean and free from contaminants particularly oil and water.
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never attempt to transfer gases from one cylinder/container to another.
- Never use direct flame or electrical heating devices to raise the pressure of a container.
- Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

7.2. Conditions for safe storage, including any incompatibilities**Storage**

- : Observe all regulations and local requirements regarding storage of containers.
- Segregate from oxidant gases and other oxidants in store.
- Keep container below 50°C in a well ventilated place. Containers should be stored in the vertical position and properly secured to prevent toppling. Stored containers should be periodically checked for general condition and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere.
- Containers should not be stored in conditions likely to encourage corrosion.

7.3. Specific end use(s)

- : None.

Fluoromethane (R41)**059****SECTION 8. Exposure controls/personal protection****8.1. Control parameters**

DNEL: Derived no effect level (Workers) : None available.
PNEC: Predicted no effect concentration : None available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls : Ensure exposure is below occupational exposure limits (where available).
Gas detectors should be used when flammable gases/vapours may be released.
Consider work permit system e.g. for maintenance activities.
Systems under pressure should be regularly checked for leakages.
Provide adequate general and local exhaust ventilation.

8.2.2. Individual protection measures, e.g. personal protective equipment : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.
The following recommendations should be considered.
PPE compliant to the recommended EN/ISO standards should be selected.

- **Eye/face protection** : Wear safety glasses with side shields or goggles when transfilling or breaking transfer connections
Wear safety glasses with side shields
Standard EN 166 - Personal eye-protection.
- **Hand protection** : Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.
- **Other** : Wear safety shoes while handling containers.
Consider the use of flame resistant anti-static safety clothing.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
Standard EN ISO 14116 - Limited flame spread materials.
Standard EN ISO 1149-5 - Protective clothing: Electrostatic properties.

• **Thermal hazards** : None necessary.

8.2.3. Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9. Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Appearance

Physical state at 20°C / 101.3kPa : Gas.

Colour : Colourless.

Odour : No odour warning properties.

Odour threshold : Odour threshold is subjective and inadequate to warn for overexposure.

Molar mass [g/mol] : 34

Melting point [°C] : -142

Boiling point [°C] : -78.4

Critical temperature [°C] : 44.5

Flash point [°C] : Not applicable for gases and gas-mixtures.

Evaporation rate (ether=1) : Not applicable for gases and gas-mixtures.

Flammability range [vol% in air] : 5.6 Not known.

Vapour pressure [20°C] : 33 bar

Relative density, gas (air=1) : 1.2

Relative density, liquid (water=1) : 0.61

Fluoromethane (R41)**059****SECTION 9. Physical and chemical properties (continued)**

Solubility in water [mg/l] : 2295
Partition coefficient n-octanol/water [log Pow] : 0.51
Auto-ignition temperature [°C] : Not known.

9.2. Other information

Other data : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10. Stability and reactivity**10.1. Reactivity**

: No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

: Stable under normal conditions.

10.3. Possibility of hazardous reactions

: May react violently with oxidants.
Can form explosive mixture with air.

10.4. Conditions to avoid

: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

10.5. Incompatible materials

: Air, Oxidiser.
For additional information on compatibility refer to ISO 11114

10.6. Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. Toxicological information**11.1. Information on toxicological effects**

Acute toxicity : No known toxicological effects from this product.
Skin corrosion/irritation : No known effects from this product.
Serious eye damage/irritation : No known effects from this product.
Respiratory or skin sensitisation : No known effects from this product.
Carcinogenicity : No known effects from this product.
Germ cell mutagenicity : No known effects from this product.
Reproductive toxicity : No known effects from this product.
STOT-single exposure : No known effects from this product.
STOT-repeated exposure : No known effects from this product.
Aspiration hazard : Not applicable for gases and gas-mixtures.

Fluoromethane (R41)**059****SECTION 12. Ecological information****12.1. Toxicity**

: No data available.

12.2. Persistence and degradability

: No data available.

12.3. Bioaccumulative potential: Not expected to bioaccumulate due to the low log Kow (log Kow < 4).
Refer to section 9.**12.4. Mobility in soil**

: Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Results of PBT and vPvB assessment

: No data available.

12.6. Other adverse effects

Effect on ozone layer : None.
Effect on the global warming : Contains Fluorinated greenhouse gases covered by the Kyoto protocol.
Global warming potential [CO2=1] : 97

SECTION 13. Disposal considerations**13.1. Waste treatment methods**

: Do not discharge into areas where there is a risk of forming an explosive mixture with air.
Waste gas should be flared through a suitable burner with flash back arrestor.
Avoid discharge to atmosphere.
Refer to the code of practice of EIGA (Doc. 30/10 "Disposal of Gases, downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods
Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere.
Do not discharge into any place where its accumulation could be dangerous.

List of hazardous waste : 14 06 01: Chlorofluorocarbons, HCFC, HFC.

13.2. Additional information

: None.

SECTION 14. Transport information

UN number : 2454
Labelling ADR, IMDG, IATA



: 2.1 : flammable gas.

Land transport (ADR/RID)

H.I. nr : 23
UN proper shipping name : METHYL FLUORIDE (REFRIGERANT GAS R 41)



SAFETY DATA SHEET in accordance with REACH regulation 1907/2006/EC

Page : 8 / 9

Revised edition no : 3 - 00

Date : 31 / 1 / 2014

Supersedes : 2 / 10 / 2012

Fluoromethane (R41)**059****SECTION 14. Transport information (continued)**

Transport hazard class(es) : 2
Classification code : 2 F
Packing Instruction(s) : P200
Tunnel Restriction : B/D Tank carriage: Passage forbidden through tunnels of category B, C, D
Environmental hazards : None.

Sea transport (IMDG)

Proper shipping name : METHYL FLUORIDE (REFRIGERANT GAS R 41)
Class : 2.1
Emergency Schedule (EmS) - Fire : F-D
Emergency Schedule (EmS) - Spillage : S-U
Packing instruction : P200
IMDG-Marine pollutant : No
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : METHYL FLUORIDE (REFRIGERANT GAS R 41)
Class : 2.1
Passenger and Cargo Aircraft : DO NOT LOAD IN PASSENGER AIRCRAFT.
Cargo Aircraft only : Allowed.
Packing instruction - Cargo Aircraft only : 200

Special precautions for user

: Avoid transport on vehicles where the load space is not separated from the driver's compartment.
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.
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.
- Ensure there is adequate ventilation.

SECTION 15. Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU legislation**

Restrictions on use : None.
Seveso directive 96/82/EC : Covered

National legislation

: Ensure all national/local regulations are observed.
- 4. BlmschV (Germany) : Listed.

15.2. Chemical safety assessment

: This product is either exempt from REACH, does not meet the minimum volume threshold for a CSR or the CSA has not yet been carried out.



SAFETY DATA SHEET
in accordance with REACH
regulation 1907/2006/EC

Page : 9 / 9

Revised edition no : 3 - 00

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Fluoromethane (R41)

059

SECTION 15. Regulatory information (continued)

SECTION 16. Other information

- Indication of changes** : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010
- Training advice** : Ensure operators understand the flammability hazard.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.
- List of full text of R-phrases in section 3.** : R12 : Extremely flammable.
- List of full text of H-statements in section 3.** : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
- Note** : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
- DISCLAIMER OF LIABILITY** : Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.
Details given in this document are believed to be correct at the time of going to press. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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