CENTRAL GLASS Co., Ltd.

Issued: January 31, 2012
Revised: October 31, 2023

Safety Data Sheet

1. Identification

Product name	: ZEM-SCREEN
Product code	: CCK-1104
Recommended use	: Cover gas for magnesium alloy casting
Manufacturer	
Company Name	: Central Glass Co., Ltd.
Address	: Kowa Hitotsubashi Bldg., 3-7-1 Kanda Nishikicho, Chiyoda-ku, Tokyo 101-0054, Japan
Section concerned	: Applied Chemicals Sales Department
Phone	: +81-3-3259-7864
Fax	: +81-3-3259-7488
Emergency Phone	: +81-3-3259-7864 (Monday-Friday 9:00 a.m.-5:30 p.m.(JST))

2. Hazard identification

Classification of the substance or mixture:

Gases under pressure	: Liquefied gas
Acute toxicity Inhalation	: Not classified

GHS label elements, including precautionary statements

Symbol

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.

3. Composition, information on ingredients

Substance or mixture	: Substance
Chemical name	: Trans-1,3,3,3-tetrafluoropropene
Synonym	: HFO-1234ze(*E*), ZEM-SCREEN
Content	: 99 % or more
Chemical Formula	: (E)-$CF_3CH=CHF$
CAS No	: 29118-24-9
TSCA inventory	: Registered

EINECS/ELINCS : 471-480-0

4. First-aid measures

Description of necessary first-aid measures

Inhalation:

- Remove to fresh air immediately. Lay patient down. Keep warm and rested.
- If breathing has stopped, apply artificial respiration.
- If breathing is difficult, give oxygen.
- Get medical attention immediately.

Skin contact:

- Remove contaminated clothing.
- Immediately flush skin with large amounts of water for at least 15 minutes.
- If frostbite, warm up the frosted parts and get medical attention.

Eye Contact:

- Immediately flush eyes for at least 15 minutes.
- Get medical attention.

Ingestion:

- Do not induce vomiting. Get medical attention immediately.

Most important symptoms /effects, acute and delayed:

- No information.

Indication of immediate medical attention and special treatment needed if necessary:

- No information.

5. Fire-fighting measures

Suitable extinguishing media:

- Water spray, dry chemical powder, carbon dioxide, appropriate foam.

Specific hazards arising from the chemical:

- If safe to do so, remove containers from path of fire.
- If cylinders cannot be moved, spray water on the cylinders and surrounding area to prevent exploding.
- Hydrogen fluoride might be formed in fire.

Special protection of fire-fighters:

- Fire fighter should wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:

- Use appropriate protection(see section 8).

Environmental precautions:

- If leakage from the container does not stop, move the container to well-ventilated area.

Methods and materials for containment and cleaning up:

- Liquid will be vaporized rapidly due to its low boiling point.
- Remove the leaking gas by using explosion-proof ventilating equipment.

7. Handling and storage

Precautions for safe handling:

- Use appropriate protection(see section 8).
- Do not heat the container by anything other than hot water at 40°C or less.
- Use explosion-proof equipment at handling facility.

- Keep pressure inside the container at more than atmospheric pressure after usage to prevent contamination.
- Handle this product, considering the possibility that hydrogen fluoride might be formed when the gas is exposed to flame or high temperature surface of metal.

Conditions for safe storage, including any incompatibilities:

- Close valve tightly after use and when empty.
- Protect from sunlight.Store in a well-ventilated place.
- Try to keep the storage place at 40°C or less.
- Keep source of fire away from the storage place.

8. Exposure control / personal protections

Control parameters:

- JSOH(2022) : No setting. [1)]
- ACGIH(2022) : No setting. [2)]

Appropriate engineering control:

- Local exhaust ventilation may be required in specific circumstances.
- Eyewash unit and shower are required near handling place.

Individual protection measures, such as personal protective equipment (PPE):

Eye/face protection:

- Chemical goggles

Skin protection:

- Chemical-resistant protective clothing

Respiratory protection:

- Gas mask and chemical cartridge respirator (organic solvent)

9. Physical and chemical properties

Appearance (physical state, colour, etc): Colorless liquid, Colorless gas at room temperature.

Odour	: Weak ethereal odor
Odour threshold	: No data available
pH	: No data available
Melting point/freezing point	: No data available
Initial boiling point and boiling range	: -19°C
Flash point	: No data available
Evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Upper/lower flammability or explosive limits:	: Noninflammable by ASHRAE method In this SDS, the data by ASHRAE method, which the method that is more globally common, was adopted to handle this product as non-flammable.
Vapor pressure	: 0.51 MPa (at 25°C)
Vapor density	: 3.94 (air =1.0)
Relative density	: 1.19 (at 25°C)
Solubility	: 0.013 (solubility in water, at 25°C)
Partition coefficient: n-octanol/water	: log Pow = 1.9
Auto-ignition temperature	: No data available
Decomposing temperature	: No data available
Viscosity	: No data available

10. Stability and reactivity

Reactivity:
- No information

Chemical stability:
- Stable at room temperature in closed containers under normal storage and handling conditions.

Possibility of hazardous reactions:
- Reacts with reactive oxygen to form COF_2 which then reacts with H_2O to form HF.

Conditions to avoid:
- Avoid exposure to flame.

Incompatible materials:
- Don't contact with strong alkali, strong oxidizing agents, and strong reducing agents.

Hazardous decomposition products:
- HF

11. Toxicological information

Acute toxicity:
- LC_{50}: higher than 207,000 ppm (rat Inhalation study)[1)]
  higher than 100,000 ppm (mouse Inhalation study) [1)]

<notes>
No lethality was found at the above two concentrations, however the animals temporally showed less activity. [1)]

Skin corrosion/irritation:
- No information

Serious eye damage/eye irritation:
- No information

Respiratory or skin sensitization:
- No information

Germ cell mutagenicity:
- No information

Carcinogenicity:
- No information

STOT - single exposure:
- No information

STOT - repeated exposure:
- No information

Aspiration hazard:
- No information

Other information:
- Ames: Negative (salmonella)
- Chromosome aberration: Negative (human lymphocytes)

12. Ecological information

Toxicity:
- No information

Persistence and degradability:
- No information

Bioaccumulative potential:
- log Pow = 1.9

Mobility in soil:

・No information

Other adverse effects:

・No information

13. Disposal considerations

Disposal methods

Product:

・Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environmental agency for specific rules).

Packing:

・Wash thoroughly and dispose according to country, federal, and local regulations.

14. Transport information

UN number	: 3163
UN proper Shipping name	: LIQUEFIED GAS, N.O.S
Transport hazard class(es)	: Divison2.2 Non-flammable , non-toxic gases
Packing group if applicable	: None
Environmental hazards	: Not applicable
Special precautions for user	: No information
Transport in bulk according to Annex Ⅱ of MARPOL 73/78 and the IBC Code	: Not applicable

Follow all regulations in your country.

15. Regulatory information

Follow all regulations in your country.

16. Other information

References

1) Japan Society for Occupational Health (2022)
2) 2022 TLVs and BEIs, ACGIH (2022)

Attentions

- We make no warranties regarding the contents shown in this SDS. Users will indemnify and hold harmless us against all actions, claims, damages, costs and expenses resulting from and/or in connection with using the contents shown in this SDS.
- The contents shown in this SDS are for normal handling.
- Special considerations may be required for particular operations.
- The contents shown in this SDS are not exhaustive. Other related documents and information should be consulted before using the product.