

MATERIAL SAFETY DATA SHEET

HFC 365/TDCE (Pentafluorobutane/Trans 1,2 Dichloroethylene)

1. SUBSTANCE/PREPARATION AND COMPANY IDENTIFICATION

Data concerning producers

MANUFACTURER/DISTRIBUTOR: Cosutin Industrial CO., Limited
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PHONE NUMBERS Product Information: +86 136 31481545

Transport Emergency: +86 136 31481545

Medical Emergency: +86 136 31481545

Identification of the substance or the preparation

Product name	:	HFC365mfc/ TDCE
Chemical name	:	Pentafluorobutane/ Trans 1,2 Dichloroethylene
Formula:	:	C4H5F5/ C2H2Cl2
Molecular Weight	:	137.8

2. COMPOSITION/INFORMATION ON INGREDIENTS

- ◆ **1,1,1,3,3-pentafluorobutane**

CAS Number	:	406-58-6
Symbols	:	F
Phrases R	:	11
Concentration	:	80.00 %

- ◆ **Trans 1,2 Dichloroethylene**

CAS Number	:	156-60-5
Symbols	:	F
Phrases R	:	11
Concentration	:	20.00 %

3. HAZARDS IDENTIFICATION

- ◆ Presents little hazard to the environment.
- ◆ **INHALATION:** slight irritation, nausea, vomiting, drowsiness, symptoms of drunkenness
- ◆ **SKIN CONTACT:** slight irritation
- ◆ **EYE CONTACT:** slight irritation
- ◆ **INGESTION:** slight irritation
- ◆ In case of decomposition, releases hydrogen fluoride, hydrofluoric acid (HF) and carbonyl halides.
- ◆ **Hazard pictogram(s): no pictogram required**
- ◆ **Safety Description:**

- ◆ **S59 Refer to manufacturer / supplier for information on recovery / recycling.**
- ◆ **S61 Avoid release to the environment. Refer to special instructions / safety data sheets.**
- ◆

4. FIRST-AID MEASURES

Effects

Inhalation

- ◆ No reported cases of intoxication in man.
- ◆ Risk of moderate consequences experimentally observed or under certain conditions.
- ◆ At high concentrations, risk of narcosis.
- ◆ At high concentrations, risk of asphyxia by lack of oxygen.

Eyes contact

- ◆ Slight irritation.

Skin contact

- ◆ In case of repeated contact: dry and chapped skin.

Ingestion

- ◆ Gastrointestinal discomfort

First aid

Inhalation

- ◆ Remove the subject from the contaminated area. Give artificial respiration if not breathing.
- ◆ Oxygen or cardiopulmonary resuscitation if necessary.
- ◆ Consult with a physician in case of respiratory and nervous symptoms.

Eyes contact

- ◆ Flush eyes with running water for at least 15 minutes, while keeping the eyelids wide open.
- ◆ Consult with an ophthalmologist in case of persistent pain.

Skin contact

- ◆ Wash the affected skin with soap and water for at least 15 minutes. Take off all contaminated clothing immediately. Wash contaminated clothing before re-use.
- ◆ Consult with a physician in case of persistent pain or redness.

Ingestion

- ◆ Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than hips to help prevent aspiration. Call a physician immediately.

General recommendations

- ◆ Unknown symptoms : consult with a physician for advice.

If the subject is completely conscious:

- ◆ Rinse mouth and administer fresh water.

If the subject is unconscious:

- ◆ Not applicable

Medical treatmentGeneral informations

- ◆ Do not give adrenergic drugs.

5. FIRE-FIGHTING MEASURES**Common extinguishing means**

- ◆ In case of fire in close proximity, regular dry chemical, carbon dioxide, regular foam

Inappropriate extinguishing means

- ◆ Water.

Specific hazards

- ◆ Formation of dangerous gas/vapours in case of decomposition (see section 10).
- ◆ Gas/vapours are heavier than air and so may travel along the ground; remote ignition possible.
- ◆ Gas/vapours explosion possible in presence of air.

Protective measures in case of intervention

- ◆ Evacuate all non-essential personnel.
- ◆ Intervention only by capable personnel who are trained and aware of the hazards of the product.
- ◆ Wear self contained breathing apparatus when in close proximity or in confined spaces.
- ◆ When intervention in close proximity wear acid resistant over suit.
- ◆ After intervention, proceed to clean the equipment (take a shower, remove clothing carefully, clean and check).

Other precautions

- ◆ If safe to do so, remove the exposed containers, or cool with large quantities of water.
- ◆ Approach from upwind.
- ◆ Avoid propagating the fire, when directing the extinguishing means in a jet on the surface of the burning liquid.
- ◆ After the fire, proceed rapidly to clean the surfaces exposed to the fumes in order to limit the damage to the equipment.
- ◆ As for any fire, ventilate and clean the rooms before re-entry.

6. ACCIDENTAL RELEASE MEASURES**Precautions**

- ◆ Follow the protective measures given in section 5.
- ◆ Follow the protective measures given in section 8.
- ◆ Eliminate all sources of ignition, and do not generate flames or sparks.
- ◆ Keep away materials and products which are incompatible with the product (see section 10).
- ◆ Approach from upwind.
- ◆ Cover the spreading liquid with foam in order to slow down the evaporation.
- ◆ If safe to do so, without over exposing anyone, try to stop the leak.
- ◆ Ventilate the premises.

Cleanup methods

- ◆ If possible, dam large quantities of liquid with sand or earth.
- ◆ Prevent the product from entering sewers or confined places.
- ◆ Collect the product with suitable means.
- ◆ Place everything into a closed, labelled container compatible with the product.
- ◆ Store the product in a safe and isolated place.
- ◆ Clean the area with large quantities of water.
- ◆ For disposal methods, refer to section 13.

Precautions for protection of the environment

- ◆ Prevent discharges into the environment (atmosphere,...).

7. HANDLING AND STORAGE**Handling**

- ◆ Carry out industrial operations in closed, but vented, piping circuits and equipment.
- ◆ Operate in a well-ventilated area.
- ◆ Handle small quantities under a lab hood.
- ◆ Do not use tools that produce sparks. Use only equipment and materials which are compatible with the product.
- ◆ Perform filling operations only at stations with exhaust ventilation facilities. Open drum carefully as content may be under pressure. Do not breathe vapours or spray mist.
- ◆ Prevent product vapours decomposition from contacting hot spots.
- ◆ Keep away from heat and sources of ignition..
- ◆ Keep away from reactive products (see section 10).

Storage

- ◆ Keep containers tightly closed in a dry, cool and well-ventilated place.
- ◆ Keep away from ignition and heat sources and direct sunlight.
- ◆ Keep away from reactive products (see section 10).
- ◆ Ensure adequate ventilation, especially in confined areas. Keep in original packaging, tightly closed.

Other precautions

- ◆ Grounded equipment.
- ◆ Containment bund around storage containers and transfer installation.
- ◆ No open flames or sparks, no smoking.
- ◆ Follow the protective measures given in section 8.

Packaging

- ◆ Steel

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Engineering controls**

- ◆ Premises ventilation.
- ◆ Provide local ventilation suitable for the emission risk.
- ◆ Follow the protective measures given in section 7.

- ◆ Maintain employee exposures to levels below the applicable exposure limits.

Respiratory protection

- ◆ Minimum need if the local exhaust ventilation is adequate.
- ◆ In case of emissions, self-contained breathing apparatus.
- ◆ Use only respiratory protection that conforms to international/ national standards.

Hand protection

- ◆ Protective gloves - chemical resistant, Gloves must be inspected prior to use.
- ◆ Recommended materials: Neoprene

Eye protection

- ◆ Wear protective goggles for all industrial operations. Do not wear contact lenses.

Skin protection

- ◆ Protective clothing treated antistatic.
- ◆ Apron/boots of neoprene if risk of splashing.

Other precautions

- ◆ Shower and eye wash stations.
- ◆ Handle in accordance with good industrial hygiene and safety practice.
- ◆ Avoid contact with skin, eyes and clothing.
- ◆ Ensure adequate ventilation, especially in confined areas.
- ◆ Remove and wash contaminated clothing before re-use.
- ◆ Contaminated work clothing should not be allowed out of the workplace.
- ◆ Keep working clothes separately.
- ◆ Wash hands before breaks and immediately after handling the product.
- ◆ Do not smoke, eat and drink in the working area.

■ **Exposure Guidelines**

TRANS-1,2-DICHLOROETHYLENE:

200 ppm (790 mg/m³) OSHA TWA

200 ppm ACGIH TWA

200 ppm (790 mg/m³) NIOSH recommended TWA 10 hour(s)

For Unknown Concentrations or Immediately Dangerous to Life or Health:

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquefied

Color/Colour: colorless/colourless

Odor/Odour: ethereal

Change of state

- ◆ Freezing point:
No data

- ◆ Boiling point/range (1013 mbars):
42 Cel

Flash point

- ◆ None

Flammability

- ◆ Upper limit
13 %(V)

- ◆ Lower limit
3.4 %(V)

Auto-flammability

- ◆ = 580 Cel

Vapor/vapour pressure

- ◆ 43.3 – 53.33 kPa
temperature 30 Cel

Density

- ◆ Specific gravity
= 1.26 - 1.27
temperature 20 Cel

Vapor/vapour density (air=1)

- ◆ = 4.7 - 4.8
temperature 20 Cel

Solubility

- ◆ Soluble in Water
1.7 g/l
temperature 20 Cel

pH

- ◆ = 6
Concentration 1.7 g/l

Partition coefficient P (n-octanol/water)

- ◆ log P o/w 1.6
Method: Measured value

Viscosity

- ◆ 0.4 mPa.s
temperature 25 Cel

Danger of explosion

- ◆ Remark: Explosion possible with gas/vapour and air mixtures.

10. STABILITY AND REACTIVITY

Stability

- ◆ Stable under certain conditions (see below).
- ◆ Decomposition produces dangerous gases, upon contact with flames or hot metallic surfaces.

Conditions to avoid

- ◆ Keep away from direct sunlight.
- ◆ Heat, flames and sparks.

Materials to avoid

- ◆ Oxidizing agents
- ◆ Metallic powders
- ◆ Alkaline metals

Hazardous decomposition products

- ◆ Hydrogen fluoride
- ◆ Fluorophosgene
- ◆ halogenated compounds
- ◆ phosgene
- ◆ oxides of carbon

Other information

- ◆ The vapor is heavier than air, disperses at ground level.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

- ◆ Inhalation, LC 50, 4 h, rat, > 10 %
- ◆ Oral route, LD 50, rat, > 2,000 mg/kg (HFC365mfc)

Irritation

- ◆ Rabbit, non irritant (skin)(HFC365mfc) . Skin irritation - 24 h(TDCE)
- ◆ Rabbit, slightly irritant (eyes)(HFC365mfc) . Eye irritation (TDCE)

Sensitization

- ◆ Guinea Pig, Non sensitizing (skin) (HFC365mfc)

Chronic toxicity

Potential health effects

- ◆ Inhalation, after repeated exposure, rat, Target organ: skeleton, 50,000 ppm, observed effect (HFC365mfc)
- ◆ Inhalation, after a single exposure, dog, >= 7.5 % , cardiac sensitization following adrenergic stimulation (HFC365mfc)
- ◆ No mutagenic effect (HFC365mfc)
- ◆ Inhalation Harmful if inhaled. Causes respiratory tract irritation.

Potential health effects(TDCE)

- ◆ Inhalation: Harmful if inhaled. Causes respiratory tract irritation.
- ◆ Ingestion: Harmful if swallowed.

- ◆ Skin: May be harmful if absorbed through skin. Causes skin irritation.
- ◆ Eyes: Causes serious eye irritation.

Comments

Additional Information: RTECS: KV9400000

12. ECOLOGICAL INFORMATION

Acute ecotoxicity

- ◆ Fishes, Brachydanio rerio, LC 50, 96 h, > 200 mg/l (HFC365mfc)
- ◆ Crustaceans, Daphnia magna, NOEC, 48 h, > 200 mg/l (HFC365mfc)
- ◆ Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) - 220,00 mg/l - 48 h (TDCE)
- ◆ Bacteria, LC50, Species: not specified. no data available (TDCE)
- ◆ Algae, Selenastrum capricornutum, NOEC, 72 h, = 113 mg/l (HFC365mfc)

Mobility

- ◆ Air, Henry's law constant (H) ca. 3.8 kPa.m³/mol
Result: considerable volatility
Conditions: 20 °C / calculated value (HFC365mfc)
- ◆ Soil/sediments, adsorption, log KOC ca. 1.8
Conditions: calculated value (HFC365mfc)

Abiotic degradation

- ◆ Air, indirect photo-oxidation, t 1/2 ca. 7.04 year(s)
Conditions: sensitizer: OH radicals (HFC365mfc)

Biotic degradation

- ◆ Aerobic, test: ready biodegradability/closed bottle, = 13 %, 28 day(s)
Result: non-readily biodegradable (HFC365mfc)

Potential foRbioaccumulation

- ◆ Bioconcentration: log Po/w ca. 1.61
Result: improbable bioaccumulation
Conditions: measured value (HFC365mfc)

Comments

- ◆ No specific data.
- ◆ Product is persistent in air(atmospheric lifetime: 16 - 19 years).
- ◆ Hazard for the aquatic environment is limited due to product properties:
- ◆ considerable volatility.
- ◆ low bioaccumulation potential.

13. DISPOSAL CONSIDERATIONS

Waste treatment

- ◆ Dispose in compliance with local/federal and national regulations.
- ◆ It is recommended to contact the producer recycling/recovery.
- ◆ Or
- ◆ Send the product to an authorized industrial waste incinerator.
- ◆ The incinerator must be equipped with a system for the neutralisation of HF.

Packaging treatment

- ◆ To avoid treatments, as far as possible, use dedicated containers.

14. TRANSPORT INFORMATION

- ◆ UN Number 1993(HFC 365mfc)/ 1150(TDCE)
- ◆ IATA Class: No data
- ◆ Packing group: II
- ◆ Hazard label: NONFLAMMABLE LIQUID

15. REGULATORY INFORMATION

EC Labelling

- ◆ This preparation contains one substance which is not listed in EINECS nor in ELINCS.

16. OTHER INFORMATION

Revision Information

Revision Data 7 May 2015 Revision Number 3

Key

NE= Not Established NA= Not Applicable (R) = Registered Trademark

This MSDS is intended for only the selected countries to which it is applicable. For example, this MSDS is not intended for use nor distribution within North America.

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specification, unless otherwise stated. In this case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.

End of MSDS