SAFETY DATA SHEET (SDS)

1. Identification of the substance/mixture and of the company/undertaking

Product Name：MANTO Mantherm K1
Other Name：Heat Transfer Fluid
Suggested applications and limited use: Heat transfer medium.
Manufacture： Jiangsu Manto Chemistry Room B, Floor 11, Building No.1, Beitanghe Road No.8, Hengsheng Science & Technology Park, Tianning District, Chanzhou City,Jiangsu Province,China Tel: +0086-0519-85760560

2. Hazards identification

GHS Classification	
Aspiration hazard	Category 1
Short-term (acute) aquatic hazard	Category 1
Long-term (chronic) aquatic hazard	Category 1

Symbol(s):

Signal Word:

Danger

Hazard Statements:

H303 May be harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements :

Prevention:

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P312 Call a POISON CENTER/ doctor if you feel unwell.
P331 Do NOT induce vomiting.
P391 Collect spillage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Physical and chemical hazards

Not classified based on available information.

Health hazards

May be harmful if swallowed. Harmful if inhaled. May cause respiratory irritation. May be fatal if swallowed and enters airways.

Environmental hazards

Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Other hazards which do not result in classification

None known.

3. Composition/information on ingredients

Chemical name	CAS-No.	Concentration (% w/w)
Diphenyl oxide, Diphenyl ether	101-84-8	45
o-Terphenyl	84-15-1	25 -27
Biphenyl; diphenyl	92-52-4	16
m-Terphenyl	92-06-8	10 -12
Phenanthrene (impurity)	85-01-8	< 2
p-Terphenyl	92-94-4	< 1

4. First aid measures

If inhaled:

Remove person to fresh air and keep comfortable for breathing.
If breathing is difficult, give oxygen.
Consult a physician if necessary.

In case of skin contact:

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.
If skin irritation occurs: Get medical advice/ attention.
Wash contaminated clothing before reuse.

In case of eye contact:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.
Get medical attention if symptoms occur.

If swallowed:

IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
Do NOT induce vomiting.
Rinse mouth.
Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed:

Harmful if inhaled.
May cause respiratory irritation.
May cause an allergic skin reaction.
May be fatal if swallowed and enters airways.
The molten product can cause serious burns.
May be harmful if swallowed.

Notes to physician :

Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media:

Water spray
Carbon dioxide (CO2)
Dry chemical
Foam

Unsuitable extinguishing media:

Do not use a solid water stream as it may scatter and spread fire.

Hazardous combustion products:

Hazardous decomposition products due to incomplete combustion
Carbon oxides

Specific extinguishing methods:

Use a water spray to cool fully closed containers.
Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters:

Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ventilate the area.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Avoid contact with skin and eyes.
Material can create slippery conditions.
Wear appropriate personal protective equipment.

Environmental precautions:

Clear up spills immediately and dispose of waste safely.
Avoid release to the environment.
Collect spillage.

Methods and materials for containment and cleaning up:

Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
Prevent runoff from entering drains, sewers, or streams.

Prevention of secondary hazards:

Local authorities should be advised if significant spillages cannot be contained.

7. Handling and storage

Handling

Advice on safe handling:

Do not breathe vapors or spray mist.
Handle product only in closed system or provide appropriate exhaust ventilation at machinery.
In case of insufficient ventilation, wear suitable respiratory equipment.
Keep away from flames and sparks.
Wear appropriate personal protective equipment.
Avoid contact with skin, eyes and clothing.
Wash thoroughly after handling.
Wash contaminated clothing before reuse.
Drain or remove substance from equipment prior to break-in or maintenance.
Handle in accordance with good industrial hygiene and safety practice.

Avoidance of contact:

Strong oxidizing agents

Storage

Conditions for safe storage:

Store locked up.
Keep container tightly closed in a dry and well-ventilated place.
Keep in a cool place away from oxidizing agents.

8. Exposure controls/personal protection

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Diphenyl oxide, Diphenyl ether	101-84-8	PC-TWA	7 mg/m3	CN OEL
		PC-STEL	14 mg/m3	CN OEL
		TWA (Vapour)	1 ppm	
		STEL (Vapour)	2 ppm	
Biphenyl; iphenyl	92-52-4	PC-TWA	1.5 mg/m3	CN OEL
		TWA	0.2 ppm	
Phenanthrene (impurity)	85-01-8	PC-TWA	0.2 mg/m3	CN OEL
	Further information: G1 - Carcinogenic to humans			

Engineering measures:

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Respiratory protection:

Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.
Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable.
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Eye/face protection:

Wear safety glasses with side shields (or goggles).

Skin and body protection:

Wear suitable protective clothing.

Hand protection

Remarks:

Wear suitable gloves. When handling hot material, use heat resistant gloves.

Protective measures:

Ensure that eye flushing systems and safety showers are located close to the working place.

Hygiene measures:

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance:

liquid

Color:

amber

Odor:

aromatic

Odor Threshold:

not determined

pH:

No data available

Melting point/freezing point:

-18 °C

Boiling point/boiling range:

271 °C (1,013 hPa)

Flash point:

132 °C Method: Cleveland open cup

Evaporation rate:

No data available

Flammability (solid, gas):

Not applicable

Self-ignition:

585 °C

Upper explosion limit / Upper flammability limit:

7 %(V)

Lower explosion limit / Lower flammability limit:

1 %(V)

Vapor pressure:

< 0.01 hPa (20 °C)
0.134 hPa (50 °C)
623.5 kPa (380 °C)

Relative vapor density:

10

Relative density:

1.05 (25 °C)

Density:

1,084 kg/m3 (15 °C)

Solubility(ies)

Water solubility:

practically insoluble

Partition coefficient: noctanol/water:

No data available

Autoignition temperature:

not determined

Decomposition temperature:

not determined

Viscosity

Viscosity, dynamic:

No data available

Viscosity, kinematic:

4.37 mm2/s (40 °C)

Explosive properties:

Not classified

Oxidizing properties:

Not classified

Note: The above physical data is based on the typical properties of sample test in our lab. The typical properties can not been considered as COA or technical requirements.

10. Stability and reactivity

Reactivity:

None reasonably foreseeable.

Chemical stability:

Stable under normal conditions.

Possibility of hazardous reactions:

None known.

Conditions to avoid:

Heating in air.

Keep away from flames and sparks.

Incompatible materials:

Strong oxidizing agents

Hazardous decomposition products:

Emits acrid smoke and fumes when heated to decomposition.

11. Toxicological information

Acute toxicity

Product:

Acute oral toxicity:

LD50 Oral (Rat): > 2,000 mg/kg

Assessment: May be harmful if swallowed.

Acute inhalation toxicity:

LC50 (Expert judgement): 2.66 mg/l

Exposure time: 4 h

Test atmosphere: dust/mist

Assessment: Harmful if inhaled.

Acute dermal toxicity:

LD50 Dermal (Rabbit): > 2,000 mg/kg

Assessment: The substance or mixture has no acute dermal toxicity

Remarks: Not classified

Components:

Diphenyl oxide, Diphenyl ether:

Acute oral toxicity:

LD50 Oral (Rat, female): 2,830 mg/kg

Acute inhalation toxicity:

LC50: Remarks: No data available

Acute dermal toxicity:

LD50 Dermal (Rabbit, male and female): > 7,940 mg/kg

o-Terphenyl:
Acute oral toxicity:
Assessment: The component/mixture is minimally toxic after single ingestion.
Biphenyl; diphenyl:
Acute oral toxicity:
LD50 Oral (Rat, male): > 2,180 mg/kg
Assessment: The component/mixture is minimally toxic after single ingestion.
Acute inhalation toxicity:
LC50 (Rat, male and female): > 3.47 mg/l
Exposure time: 1 h
Assessment: The substance or mixture has no acute inhalation toxicity
Skin corrosion/irritation
Product:
Species:
Rabbit
Assessment:
Not classified
Result:
No skin irritation
Components:
Diphenyl oxide, Diphenyl ether:
Species:
Rabbit
Exposure time:
4 h
Result:
none
Biphenyl; diphenyl:
Species:
Rabbit
Result:
slight
Species:
Humans
Assessment:
Irritating to skin.
Result:
strong
Serious eye damage/eye irritation
Product:
Species:
Rabbit
Result:
No eye irritation
Assessment:
Not classified
Components:
Diphenyl oxide, Diphenyl ether:
Species:
Rabbit
Result:
corneal opacity
Exposure time:
4 h
Assessment:
irritating
Result:
slight to moderate
Biphenyl; diphenyl:
Species:
Rabbit
Result:
slight irritation
Species:

Humans
Result:
strong
Assessment:
Irritating to eyes.
Respiratory or skin sensitization
Product:
Test Type:
OECD 429: LLNA
Species:
Guinea pig
Method:
OECD Test Guideline 429
Result:
Causes sensitization.
Components:
Diphenyl oxide, Diphenyl ether:
Test Type:
Skin Sensitization
Species:
Guinea pig
Assessment:
Not classified
Method:
OECD 406: Guinea pig sensitization
Result
: non-sensitizing
: Human experience
: Humans
: Not classified
: Human Repeat Insult Patch Test
: non-sensitizing
Biphenyl; diphenyl:
Test Type:
OECD 406: Guinea pig sensitization
Species:
Guinea pig
Assessment:
Not classified
Result: Does not cause skin sensitisation.
Germ cell mutagenicity
Components:
Diphenyl oxide, Diphenyl ether:
Genotoxicity in vitro:
Test Type: Salmonella typhimurium assay (Ames test)
Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative
Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Cell Gene Mutation Test
Result: negative
Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Chromosome Aberration Test
Result: negative
Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: Genetic Toxicology: DNA Damage and Repair, Un scheduled DNA Synthesis in Mammalian Cells In Vitro
Result: negative
Biphenyl; diphenyl:
Genotoxicity in vitro:
Test Type: Salmonella typhimurium assay (Ames test)

Metabolic activation: +/- activation
Method: Bacterial Reverse Mutation Assay
Result: negative
Test Type: Mutagenicity - Mammalian
Metabolic activation: + activation
Method: In vitro Mammalian Cell Gene Mutation Test
Result: positive
Test Type: Chromosome aberration test in vitro
Metabolic activation: +/- activation
Method: In vitro Mammalian Chromosome Aberration Test
Result: negative
Test Type: Mutagenicity - Mammalian
Method: Genetic Toxicology: DNA Damage and Repair, Un scheduled DNA Synthesis in Mammalian Cells In Vitro
Result: negative

Genotoxicity in vivo:

Species: Mouse (male and female)
Method: Mammalian Erythrocyte Micronucleus Test
Result: negative
Species: Rat (male)
Method: Mammalian Bone Marrow Chromosome Aberration Test
Result: negative

Carcinogenicity
Components:
Biphenyl; diphenyl:
Species:

Rat, male and female

Application Route:

Ingestion

Method:

OECD Test No. 453: Combined Chronic Toxici ty/Carcinogenicity Studies

Remarks:

Expert judgement
Not classified

Reproductive toxicity
Product:
Effects on fertility:

Remarks: No data available

Components:
Diphenyl oxide, Diphenyl ether:
Reproductive toxicity - Assessment:

Based on available data the classification criteria are not met.
Not classified as hazardous.

Biphenyl; diphenyl:
Effects on fetal development:

Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: NOAEL: 3,000 ppm
Embryo-fetal toxicity.: NOAEL: 8,000 ppm
Method: OECD Test Guideline 414
Species: Rat
Application Route: Oral
General Toxicity Maternal: NOAEL: 500 mg/kg body weight
Embryo-fetal toxicity.: NOAEL: 1,000 mg/kg body weight
Method: OECD Test Guideline 414

Reproductive toxicity - Assessment:

Based on available data the classification criteria are not met.
Not classified as hazardous.

STOT - single exposure
Product:
Routes of exposure:

inhalation (dust/mist/fume)

Assessment:

May cause respiratory irritation.

Components:

Diphenyl oxide, Diphenyl ether:

Routes of exposure:

Inhalation

Assessment:

Based on available data, the classification criteria are not met.

Biphenyl; diphenyl:

Routes of exposure:

Inhalation

Target Organs:

Respiratory system

Assessment:

The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

Product:

Assessment:

Based on available data, the classification criteria are not met.

Components:

Diphenyl oxide, Diphenyl ether:

Assessment:

Based on available data, the classification criteria are not met.

Biphenyl; diphenyl:

Target Organs:

Kidney, Liver, Urinary bladder

Assessment:

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

Diphenyl oxide, Diphenyl ether:

Species:

Rat, male and female

NOAEL:

301 mg/kg

Application Route:

Oral Study

Exposure time:

90 days

Remarks:

(highest dose tested)

Species:

Rat, male and female

NOAEL:

1000 mg/kg

Application Route:

Dermal Study

Exposure time:

90 days

Remarks:

(highest dose tested)

Species:

Rat, male and female

NOAEL:

139 mg/m3

Application Route:

inhalation (vapour)

Exposure time:

28 days

Remarks:

(highest dose tested)

Biphenyl; diphenyl:

Species:

Rat, male and female

NOAEL:

39 mg/kg

Application Route:

in feed

Exposure time:

2 year

Method:

OECD Test No. 453: Combined Chronic Toxici
ty/Carcinogenicity Studies

Target Organs:

Blood, Kidney, Liver

Species:

Rabbit

NOAEL:

> 2,000 mg/kg

Application Route:

Dermal

Exposure time:

28 days

Remarks:

No significant adverse effects were reported

Aspiration toxicity
Product:

May be fatal if swallowed and enters airways.

Routes of exposure
Product:
Inhalation:

Remarks: Harmful if inhaled.
May cause respiratory irritation.

Skin contact:

Remarks: May cause an allergic skin reaction.

Eye contact:

Remarks: None known.

Ingestion:

Remarks: May be fatal if swallowed and enters airways.
May be harmful if swallowed.

12. Ecological information

Ecotoxicity
Product:
Ecotoxicology Assessment
Acute aquatic toxicity:

Very toxic to aquatic life.

Chronic aquatic toxicity:

Very toxic to aquatic life with long lasting effects.

Components:
Diphenyl oxide, Diphenyl ether:
Toxicity to fish:

LC50 (Oncorhynchus mykiss (rainbow trout)): 4.2 mg/l
Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 1.7 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants:

EC50 (Pseudokirchneriella subcapitata (algae)): 0.455 mg/l
Exposure time: 72 h

o-Terphenyl:
Toxicity to daphnia and other aquatic invertebrates:

EC50 (Daphnia magna (Water flea)): 0.045 mg/l
Exposure time: 48 h
M-Factor (Chronic aquatic toxicity): 10

Biphenyl; diphenyl:

Toxicity to fish:

EC50 (Pimephales promelas (fathead minnow)): 3 mg/l
Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 0.36 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants:

EC50 (Chlorella pyrenoidosa (aglae)): 1.3 mg/l
Exposure time: 72 h
NOEC (Chlorella pyrenoidosa (aglae)): 0.66 mg/l
Exposure time: 72 h

M-Factor (Acute aquatic toxicity):

1

Toxicity to fish (Chronic toxicity):

NOEC (Oncorhynchus mykiss (rainbow trout)): 0.229 mg/l
Exposure time: 96 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):

NOEC (Daphnia magna (Water flea)): 0.17 mg/l
Exposure time: 21 d

M-Factor (Chronic aquatic toxicity):

1

m-Terphenyl:

Ecotoxicology Assessment

Acute aquatic toxicity:

Very toxic to aquatic life.

Chronic aquatic toxicity:

Very toxic to aquatic life with long lasting effects.

Persistence and degradability

Product:

Biochemical Oxygen Demand (BOD):

Remarks: No data available

Chemical Oxygen Demand:

Remarks: No data available(COD)

Components:

Diphenyl oxide, Diphenyl ether:

Biodegradability:

Result: Readily biodegradable.
Method: Ready Biodegradability: Modified MITI Test (I)

Biochemical Oxygen Demand (BOD):

Remarks: No data available

Chemical Oxygen Demand (COD):

Remarks: No data available

Biphenyl; diphenyl:

Biodegradability:

Result: Readily biodegradable.
Method: Ready Biodegradability: Modified MITI Test (I)

Bioaccumulative potential

Components:

Diphenyl oxide, Diphenyl ether:

Bioaccumulation:

Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 49 - 594
Method: OECD Test Guideline 305
Species: Oncorhynchus mykiss (rainbow trout)
Bioconcentration factor (BCF): 196

Biphenyl; diphenyl:

Bioaccumulation:

Bioconcentration factor (BCF): 1,900

Mobility in soil

Components:

Diphenyl oxide, Diphenyl ether:

Distribution among environmental compartments:

Koc: 1960, log Koc: 3.3

Biphenyl; diphenyl:

Distribution among environ
mental compartments:
Medium: Soil
Koc: 1546, log Koc: 3.19
Method: OECD Test No. 106: Adsorption - Desorption Using a Batch Equilibrium Method

Other adverse effects

Components:

o-Terphenyl:

Results of PBT and vPvB
assessment:
This substance is considered to be very persistent and very bioaccumulating (vPvB).

13. Disposal considerations

Disposal methods

Waste from residues:

Dispose of in accordance with local regulations.
Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

International Regulations

IATA-DGR

UN/ID No.:

UN 3082

Proper shipping name:

Environmentally hazardous substance, liquid, n.o.s.

Class:

9

Packing group:

III

Labels:

Miscellaneous

Packing instruction (cargo aircraft):

964

Packing instruction (passenger aircraft):

964

Remarks:

Shipping in package sizes of less than 5 L (liquids) or 5 KG (solids) may lead to a non-regulated classification.

IMDG-Code

UN number:

UN 3082

Proper shipping name:

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Class:

9

Packing group:

III

Labels:

9

EmS Code:

F-A, S-F

Marine pollutant:

yes

Remarks:

Shipping in package sizes of less than 5 L (liquids) or 5 KG (solids) may lead to a non-regulated classification.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

Special precautions for user

	The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. Regulatory Information

National regulatory information
Law on the Prevention and Control of Occupational Diseases
The ingredients of this product are reported in the following inventories:

TCSI:
On the inventory, or in compliance with the inventory

TSCA:
All substances listed as active on the TSCA inventory

DSL:
All components of this product are on the Canadian DSL

ENCS:
On the inventory, or in compliance with the inventory

ISHL:
On the inventory, or in compliance with the inventory

KECI:
On the inventory, or in compliance with the inventory

IECSC:
On the inventory, or in compliance with the inventory

16. Other Information

Disclaimer:

The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information and responsibility given only apply for this product. This SDS provides basic safety knowledge for the product user. Although certain hazards are described herein, we cannot guarantee they are certainly correct and do not assume any legal liability. Final determination of suitability of any material is the sole responsibility of the user.