



BIPHENYL HEAT TRANSFER FLUID

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Names

BIPHENYL
DIPHENYL

Recommended Uses

Used as a heat transfer fluid.
Intermediate for organic chemicals.

ISO 9001:2008 Certification Number: C2015-00068

Company Identification

Headquarters and Manufacturing Facility
Radco Industries, Inc.
700 Kingsland Drive
Batavia, IL 60510 USA

Manufacturing Facility
Radco Industries, Inc.
39W930 Midan Drive
LaFox, IL 60147 USA

Customer information number: 1-630-232-7966

EMERGENCY TELEPHONE NUMBER**Advisory Office in case of poisoning: Chemtrec**

Chemtrec (North America): 1-800-424-9300
Chemtrec (International): 1-703-527-3887

2. HAZARDS IDENTIFICATION

Classification of mixture

Acute Aquatic Toxicity, Category 1
Serious Eye Damage, Category 1
Skin Irritation, Category 2
Specific target organ toxicity after single exposure Category 3

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Hazard Pictograms:

Signal Word: Danger

Hazard Statements:

H303: May be harmful if swallowed.

H315: Causes skin irritation.

This Safety Data Sheet (SDS) meets the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).



- H318: Causes serious eye damage.
H332: Harmful if inhaled.
H373: May cause damage to organs through prolonged or repeated exposure.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statements:

- P202: Do not handle until all safety precautions have been read and understood.
P261: Avoid breathing vapors.
P262 + P280: Do not get in eyes, on skin, or on clothing, and use personal protective equipment as required.
P270: Do not eat, drink or smoke when using this product.
P273: Avoid release to the environment.
P280: Wear protective gloves, protective clothing, eye protection, and face protection.
P301 + P315 + P330 + P331: IF SWALLOWED: Do NOT induce vomiting. Rinse mouth. Get immediate medical attention.
P304 + P315 + P341: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical attention.
P305 + P315 + P338 + P351: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Get immediate medical attention.
P362: Take off contaminated clothing and wash before reuse.
P405: Store locked up.
P501: Dispose of contents and container to an approved waste disposal plant.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	%Content	CAS Number	EC Number
Biphenyl (diphenyl)	100%	92-52-4	202-163-5

4. FIRST-AID MEASURES

Eye Contact

Rinse thoroughly with plenty of water for at least 15 minutes, and immediately get medical attention.

Ingestion

Rinse mouth with water. DO NOT INDUCE VOMITING. Get medical attention immediately.

Inhalation

Move to fresh air. If unconscious place in recovery position and seek medical advice. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. Remove from further exposure. Immediately call a doctor.

Skin Contact

Wash affected area gently with soap and water. Seek medical attention.



5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

For small fires use carbon dioxide, dry chemical or foam.

For large fires use alcohol-type foam, universal type foam or water fog.

Fire-Fighting Equipment

Firefighter should wear normal protective equipment (full bunker gear) and positive-pressure contained breathing apparatus. Water can be used to cool fire-exposed containers, to protect personnel and to disperse vapors and spills. Water runoff can cause environmental damage. Dike and collect water used to fight fires.

Special Fire-Fighting Procedures

Use water spray to cool fire-exposed containers and structures. If a rail or tank truck is involved in a fire, isolate for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from the area and let the fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.

6. ACCIDENTAL RELEASE MEASURES

Reportable spill quantity for Biphenyl is 168 kg (370 pounds):

622 kg (1,371 pounds) of XCEL THERM[®] MK1 contains approximately 168 kg (370 pounds) of Biphenyl. This is equivalent to 155 gallons of product.

Soak up small with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. If it is safe to do so, shut off, close, dike or dam source of leak or spill.

7. HANDLING AND STORAGE

Handling

Do not breathe vapors/dust. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.

Storage

Do not store in open or unlabeled containers. Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Biphenyl (vapor):

ACGIH TWA = 0.2 ppm

OSHA Table = 0.2 ppm

Z- 1

Respiratory Protection

Dust mask type N95 (US). Use with adequate ventilation. Avoid breathing vapor. If heated and ventilation is inadequate, use NIOSH certified respirator, which will protect against organic vapor.

Hand Protection

Wear clothing and gloves that cannot be penetrated by chemicals or oil.

Eye Protection

Safety glasses, chemical goggles, or face shields recommended to prevent contact.



9. PHYSICAL AND CHEMICAL PROPERTIES

“Physical and Chemical Properties” data represents typical laboratory samples, and are not guaranteed for all samples.

Appearance:	Colorless to pale-yellow flakes
Odor:	Aromatic
Odor threshold:	0.01 ppm
Auto-ignition temperature:	540°C (1,004°F)
Decomposition temperature:	Not available
Evaporation Rate:	Not available
Flash point Cleveland Open Cup (ASTM D92):	113°C (235°F)
Flash point Pensky-Martens (ASTM D93):	Not available
Flammability (solid, gas):	Must be preheated (NFPA)
Lower flammability limit:	0.6 vol%
Upper flammability limit:	5.6 vol%
Normal Boiling Point:	254°C to 255°C (489.2°F to 491°F)
Melting point/Freezing Point:	68.9 (156°F)
Partition coefficient (n-octanol/water), Log P _{ow} :	Not applicable
pH:	Not applicable
Solubility in water:	4.45 mg/L at 20°C (68°F) 7.35 mg/L at 25°C (77°F)
Specific Gravity (ASTM D1298)	1.0 at 25°C (77°F)
Vapor density (Air = 1):	5.31
Vapor pressure:	0.03 mmHg at 20°C (68°F) 4.1 mmHg at 100°C (212°F)
Kinematic Viscosity (ASTM D445):	0.97 mm ² /s at 100°C (212°F)

10. STABILITY AND REACTIVITY INFORMATION

Materials to avoid

Exposure to materials which are highly oxidizing should be avoided.

Hazardous polymerization

Does not occur.

Hazardous decomposition products

Incomplete combustion may give various cracked and oxidized hydrocarbons.

Stability

Stable

11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity

Rat:	LD50 ≥ 2,400 mg/kg
Mouse:	LD50 ≥ 1,900 mg/kg



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Rabbit: LD50 \geq 2,400 mg/kg

Acute Inhalation Toxicity

Mouse: LC50 > 0.275 mg/L at 4 hours

Skin

Guinea pig: Irritant

Rabbit: LD50 \geq 5,010 mg/kg

Carcinogenicity

There is no human data and inadequate studies in mice and rats to classify the carcinogenicity of biphenyl to humans. Genotoxicity tests on biphenyl are generally negative. *Reference: National Library of Medicine Hazardous Substances Database.*

12. ECOLOGICAL CONSIDERATIONS

Aquatic toxicity

This product is very toxic to aquatic life with long lasting effects.

EC50 Fathead Minnow = 3 mg/L at 96 hours

EC50 *Daphnia magna* = 0.36 mg/L at 48 hours

EC50 Alga = 1.3 mg/L at 72 hours

NOEC *Oncorhynchus mykiss* = 0.229 mg/L at 96 days

NOEC *Daphnia magna* = 0.17 mg/L at 21 days

NOEC Alga = 0.66 mg/L at 72 hours

Biodegradability

Biphenyl is readily biodegradable by OECD/EEC biodegradability specification.

13. DISPOSAL INFORMATION

Disposal must be in accordance with applicable federal, state, or local regulations.

Do not allow product to reach ground water, water course, or sewage systems.

This unused material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable, or reactive according to U.S. EPA definitions (40 CFR Subpart C). This material could also become hazardous waste if it is mixed with or comes into contact with a listed hazardous waste. If it is a hazardous waste, regulations in 40 CFR 262-266, 268, 270, and 279 may apply.

“Empty” containers retain residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition; they may explode and cause injury or death. Do not attempt to clean since residue is difficult to remove and even a trace of remaining material constitutes as explosive hazard. “Empty” drums should be completely drained, properly bunged, and promptly returned to a drum recycler. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

14. TRANSPORT INFORMATION

Reportable spill quantity

Biphenyl's (diphenyl) reportable spill quantity is 45.4 kg (100.0 pounds).



U.S. Dept. of Transportation

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O.S. (BIPHENYL)
Technical Name: BIPHENYL
Hazard Class: 9
ID Number: UN3077
Packing Group: PG III

International Maritime Organization (IMDG)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O.S. (BIPHENYL)
Technical Name: BIPHENYL
Hazard Class: 9
ID Number: UN3077
Packing Group: PG III
EMS Number: F-A, S-F
Marine Pollutant: Yes
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Product Name: BIPHENYL
Ship Type: 2
Pollution Category: X

International Civil Aviation Organization and International Air Transport Association (ICAO/IATA)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O.S. (BIPHENYL)
Technical Name: BIPHENYL
Hazard Class: 9
ID Number: UN3077
Packing Group: PG III
Cargo Packing Instruction: 964
Passenger Packing Instruction: 964

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard: Yes
Delayed (Chronic) Health Hazard: Yes
Fire Hazard: No
Reactive Hazard: No
Sudden Release of Pressure Hazard: No



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Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

Biphenyl is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 that is listed in 40 CFR 372.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List

The following product is cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

U. S. Toxic Substances Control Act (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical List

Biphenyl is listed as a toxic substance.

OSHA

Biphenyl is listed as a hazardous substance.

Canada - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Australia Inventory (AICS)

Listed on inventory.

China (CICS)

None of the ingredients are listed.

EC Inventory (EINECS/ELINCS)

In Compliance

International Agency for Research on Cancer (IARC)

None of the ingredients are listed.

Japan Inventory (MITI)

Listed on inventory.

Korea Inventory (ECL)

Listed on inventory.

16. OTHER INFORMATION

Safety Data Sheet Creation Date: 1 October 2012
Safety Data Sheet Revision Date: 12 February 2016

THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH



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