



XCEL THERM® LV1 GRADE HEAT TRANSFER FLUID

SAFETY DATA SHEET

Issue Date: 10 December 1999

Revision Date: 6 October 2017

Revision Number: 4.0

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier

Product Name: XCEL THERM® LV1 Heat Transfer Fluid

ISO 9001:2008 Certification Number: C2015-00068

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

Liquid or vapor phase to 371°C (700°F)

1.3 Details of the supplier of the safety data sheet

Headquarters and Manufacturing Facility

Radco Industries, Inc.

700 Kingsland Drive

Batavia, IL 60510

CAGE Code 6ZS16

Customer information number: 1-630-232-7966

1.4 Emergency Telephone Number

Advisory Office in case of poisoning: Chemtrec

Chemtrec (North America): 1-800-424-9300

Chemtrec (International): 1-703-527-3887

SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Aquatic toxicity, acute hazards	Category 1
Aquatic toxicity, chronic hazards	Category 1
Serious eye irritation	Category 2B
Skin irritation	Category 2

Classifications of mixture is in accordance with United Nations (UN) Globally Harmonized System of Classification and Labelling of Chemicals (GHS), sixth revised edition (2015), and United States Standard 29 CFR 1910 Occupational Safety and Health Standards.

See SECTION 16 for toxicity category definitions.

2.1 Label elements



Exclamation



Environmental Hazard

Hazard pictograms:

Signal word:

Warning

Hazard statements

H315:	Causes skin irritation.
H319:	Causes serious eye irritation.
H335:	May cause respiratory irritation.



H410:	Very toxic to aquatic life with long-lasting effects.
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Precaution statements

P101:	If medical advice is needed, have product container or label at hand.
P202:	Do not handle until all safety precautions have been read and understood.
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/face protection.
P301 + P331 + P315:	IF SWALLOWED: Do NOT induce vomiting. Rinse mouth. Get immediate medical advice/attention.
P303 + P353:	IF ON SKIN (or hair): Rinse skin with water/shower.
P304 + P340 + P342 + P315:	IF INHALED: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms, get immediate medical advice/attention.
P305 + P351 + P338 + P310:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
P306 + P363:	IF ON CLOTHING: Wash contaminated clothing before reuse.
P404:	Store in a closed container.
P501:	Dispose of contents/container to in accordance with local/regional/national/international regulation.

2.2 Other hazards

PBT and vPvB

This product is not PBT and vPvB based on components.

NFPA Hazard ID

Health: 1
Flammability: 1
Reactivity: 0

HMIS Hazard ID

Health: 1
Flammability: 1
Reactivity: 0

SECTION 3. Composition/information on ingredients

3.1 Substances

1,1-Diphenylethane

Index number: Not available
CAS number: 612-00-0
EC number: 254-179-7
REACH number: 01-2119976366-24
Synonyms: (phenylethyl)benzene; 1,1'-ethane-1,1-diylidibenzene;

Diphenyl oxide

Index number: Not available
CAS number: 101-84-8
EC number: 202-981-2
REACH number: 01-2119472545-33
Synonyms: 1,1-Diphenylethane oxide; Diphenyl ether

3.2 Mixtures

Description of mixture:

Binary mixture of synthetic aromatics



Component	CAS Number	EC Number	%Content	Classification of Labeling	M-Factor
1,1-Diphenylethane	612-00-0	254-179-7	82%	Eye Irrit. 2A – H319	--
Diphenyl oxide	101-84-8	202-981-2	18%	Aquatic Acute 1 – H400 Eye Irrit. 2A – H319	1 --

M-Factor determinations are in accordance with UN GHS, sixth revised edition (2015).

See SECTION 16 for full text of the toxicity categories and H-statements listed in this section.

Indicative occupational exposure limit values

Component	Specific Concentration limits
1,1-Diphenylethane	No data available
Diphenyl oxide	See SECTION 8 for specific concentration limits.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye contact

Upon accidental eye exposure, wash the eyes promptly with water for at least 20 minutes. If wearing contact lenses, remove them if safe to do so, and continue washing. Get medical attention immediately.

Ingestion

If swallowed, do not induce vomiting. Rinse mouth out with water. Get medical attention immediately.

Inhalation

If respiratory irritation, dizziness, or nausea occurs, move to fresh air and keep at rest in a comfortable position for breathing. If symptoms persist or unconsciousness occurs, seek immediate medical assistance.

Skin contact

Wash skin thoroughly with mild soap and plenty of water for at least 20 minutes. If irritation develops, seek medical advice.

Note to physicians

Treat symptomatically.

4.2 Most important symptoms and effects, both acute and delayed

Acute symptoms

Eye exposure symptoms

Direct eye exposure may lead to redness and lacrimation (crying tears).

Ingestion symptoms

Small amounts may cause nausea. Large amounts may lead to abdominal obstruction (cramps), constipation or diarrhea.

Inhalation symptoms

May cause irritation of the nose, throat, and lungs.

Skin exposure symptoms

Short-term exposure is not expected to cause irritation.

Delayed symptoms

Eye exposure symptoms

None expected, however seek medical attention if irritation persists.

Ingestion symptoms

None expected, however seek medical attention if abdominal obstruction, constipation or diarrhea persists.

Inhalation symptoms

None expected, however seek medical attention if respiratory irritation persists.



Skin exposure symptoms

Repeated exposure may lead to irritation. If rash develops, seek medical attention.

4.3 Indication of any immediate medical attention and special treatment needed

Suggestions for clinical testing and medical monitoring for delayed effects are not known. Use first aid when applicable, and seek guidance from a medical physician for specific treatment.

SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media includes alcohol-resistant foam, carbon dioxide, dry chemical or water fog.

5.2 Special hazards arising from the substance or mixture

No data is available.

5.3 Advice for firefighters

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.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Wear personal protective equipment (PPE). Eliminate sources of ignition, if safe to do so. Avoid breathing vapors or mist. Evacuate to designated safe areas.

For emergency responders

If possible, move individual to safe area, and treat symptomatically.

6.2 Environmental precautions

Contain spill, if safe to do so. Prevent from entering sewers or drains.

6.3 Methods and material for containment and cleaning up

Use oil absorbent material to soak up product on the ground. Should this product enter sewers or drains, it should be pumped out into an open vessel. The recovered material should be discarded as hazardous waste.

6.4 Reference to other sections

If appropriate, refer to SECTION 8 and SECTION 13 for additional information.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Use personal protective equipment (PPE) when handling this product. Smoking, eating and drinking should be prohibited in the application area.

7.2 Conditions for safe storage, including any incompatibilities

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



7.3 Specific end use(s)

Recommended for PET production, Synthetic Fiber plants and many other applications that require a high temperature heat transfer fluid.

SECTION 8.

8.1 Control parameters

Occupational exposure limits

Component	Form	Exposure Limits
1,1-Diphenylethane	--	No data available
Diphenyl oxide	Vapor	ACGIH (United States, 2001) TWA = 1 ppm, 7 mg/m ³
	Vapor	ACGIH (United States, 2001) STEL = 2 ppm, 14 mg/m ³
	Vapor	NIOSH (United States, 4/2016) TWA = 1 ppm, 7 mg/m ³
	Vapor	OSHA Z-1 (United States, 6/2010) TWA = 1 ppm, 7 mg/m ³

Biological exposure limits

None established for any of the disclosed components.

8.2 Exposure controls

Appropriate engineering controls

Practice general industrial hygiene. Do not eat, drink or smoke near product. Wash hands after handling. Remove clothing and wash separate from other laundry.

Personal protective equipment (PPE)

Eye/face protection

Safety glasses, chemical safety goggles and/or face shields are recommended when handling this product.

Skin protection

For extended handling, wear oil resistant gloves such as neoprene. Nitrile gloves may be appropriate for short handling periods use. Contact a government approved or accredited manufacturer for specific recommendations.

Other protections

Wear protective clothing ensuring minimal skin exposure. Protective clothing should be chemically impervious to oils and other solvents.

Respiratory protection

Use with adequate ventilation. Avoid breathing vapor. If heated and ventilation is inadequate, use NIOSH certified respirator, which will protect against organic vapor.

Environmental exposure controls

Do not allow product to reach ground water, water course, or sewage systems. Stop leaks, if safe to do so. Contain spills with absorbent or adsorbent materials.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	Colorless to straw-colored liquid
Odor:	Aromatic
Odor threshold:	1 part per million (ppm)
Auto-ignition temperature:	604°C (1120°F)
Decomposition temperature:	0.2% mass at 371°C (700°F)
Evaporation Rate:	Not determined
Explosive properties:	Not determined



Flammability (solid, gas):	Non-flammable
Lower flammability limit:	Not available
Upper flammability limit:	Not available
Flash point Cleveland Open Cup (ASTM D92):	122°C (252°F)
Flash point Pensky-Martens (ASTM D93):	107°C (225°F)
Normal boiling point:	258°C (496°F)
Melting point/freezing point:	7.2°C (45°F)
Oxidizing properties:	Not determined
Partition coefficient (n-octanol/water), Log P _{ow} :	Not determined
pH:	Not applicable
Relative density (ASTM D1298) 15.6°C/15.6°C (60°F/60°F):	1.06
Solubility in water:	Insoluble
Vapor density:	Not determined
Vapor pressure:	< 1 mmHg at 20°C (68°F)
Viscosity (ASTM D445):	5.0 mm ² /s (cSt) at 20°C (68°F)

9.2 Other information

No further information is available.

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity

Non-reactive in its original state.

10.2 Chemical stability

Stable in its original state.

10.3 Possibility of hazardous reactions

Does not occur.

10.4 Conditions to avoid

Oxidizing materials

10.5 Incompatible materials

Keep away from strong oxidizing or reducing agents.

10.6 Hazardous decomposition products

Decomposition of this product under fire conditions may produce carbon oxides, phenols, and other decomposition products.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	Method	Species	Result
1,1-Diphenylethane	Dermal	Rat	LD ₅₀ > 2000 mg/kg body-weight
	Inhalation	Rat	LC ₅₀ = 1 – 5 mg/L
	Oral	Rat	LD ₅₀ = 2531 mg/kg body-weight
Diphenyl oxide	Dermal	Rabbit	LD ₅₀ > 7940 mg/kg
	Inhalation	--	No data available
	Oral	Rat	LD ₅₀ = 2830 mg/kg body-weight



Aspiration hazard	Result
1,1-Diphenylethane	LC ₅₀ = 1 – 5 mg/L
Diphenyl oxide	No data available

Carcinogenicity	Result
1,1-Diphenylethane	Not a known carcinogen by IARC, NTP or OSHA
Diphenyl oxide	Not a known carcinogen by IARC, NTP or OSHA

Eye damage / irritation	Test Method	Species	Results
1,1-Diphenylethane	Read across	Rabbit	Not irritating
Diphenyl oxide	Read across	Rabbit	Moderately irritating

Germ cell mutagenicity	Test Method	Species	Results
1,1-Diphenylethane	OECD 471	<i>S. typhimurium</i>	Not mutagenic
Diphenyl oxide	Ames Assay	<i>S. typhimurium</i>	Not mutagenic

Reproductive toxicity	Test Method	Species	Results
1,1-Diphenylethane	OECD 422	Rat	Parental NOAEL = 30 mg/kg bodyweight/day Reproduction NOAEL = 100 mg/kg bodyweight/day Developmental NOAEL = 10 mg/kg bodyweight/day
	OECD 422	Rat	
	OECD 422	Rat	
Diphenyl oxide	OECD 414	Rat	Not toxic to reproduction

Respiratory sensitization	Results
1,1-Diphenylethane	No data available
Diphenyl oxide	No data available

Skin sensitization	Test Method	Species	Results
1,1-Diphenylethane	OECD 406	Guinea pig	Not sensitizing
Diphenyl oxide	Read across	Human	Not sensitizing

Skin corrosion/irritation	Test Method	Species	Results
1,1-Diphenylethane	OECD 404	Rabbit	Irritating
Diphenyl oxide	Read across	Rabbit	Not irritating

Specific target organ toxicity – repeated exposure (STOT-RE)	Route	Results
1,1-Diphenylethane	--	No data available
Diphenyl oxide	Dermal	NOEL = 100 mg/kg/day NOEL = 4.9 ppm after 7 hours NOEL = 318 mg/kg/day
	Inhalation	
	Oral	

Specific target organ toxicity – single exposure (STOT-SE)

No data available

11.2 Other information

See SECTION 16 for toxicity references.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

Aquatic Toxicity	Test Method	Species	Results
1,1-Diphenylethane	OECD 201	<i>S. subspicatus</i>	EC ₅₀ = 0.56 mg/L
	OECD 202	<i>Daphnia sp.</i>	NOEC = 0.18 mg/L after 48 hours
	OECD 203	<i>Danio rerio</i>	LC ₅₀ = 8.4 mg/L
Diphenyl oxide	OECD 201	<i>P. subcapitata</i>	NOEC = 0.32 mg/L after 72 hours
	OECD 202	<i>D. magna</i>	LC ₅₀ = 1.7 mg/L after 48 hours
	Read across	<i>O. mykiss</i>	LC ₅₀ = 4.2 mg/L after 96 hours



Terrestrial Toxicity

No data available

12.2 Persistence and degradability

Biodegradation	Test Method	Results
1,1-Diphenylethane	--	Not readily biodegradable
Diphenyl oxide	OECD 301D	64% BOD after 5 days, readily biodegradable

12.3 Bioaccumulative potential

Bioconcentration Factor (BCF)	Results
1,1-Diphenylethane	BCF = 540 – 620
Diphenyl oxide	BCF = 450

Partition Coefficient n-octanol / water (Log K _{ow})	Results
1,1-Diphenylethane	No data available
Diphenyl oxide	4.21

12.4 Mobility in soil

Soil Mobility	Results
1,1-Diphenylethane	No data available
Diphenyl oxide	LogKoc = 3.3

12.5 Results of PBT and vPvB assessment

Chemical	Results
1,1-Diphenylethane	This substance is not PBT / vPvB.
Diphenyl oxide	This substance is not PBT / vPvB.

12.6 Other adverse effects

No further information is available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

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 U.S. EPA (40 CFR Subpart C) criteria for being toxic, corrosive, ignitable, or reactive. This material could also become hazardous waste if it is mixed with or meets a listed hazardous waste. If it is a hazardous waste, regulations in 40 CFR 262-266, 268, 270, and 279 may apply.

SECTION 14. TRANSPORTATION INFORMATION

United States Department of Transportation (DOT)

Not regulated

Canada Transport - Transportation of Dangerous Goods (TDG)

UN Number: UN3082

UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (1,1-DIPHENYLETHANE AND DIPHENYL OXIDE MIXTURE)

Transport hazard class: 9

Packing group: III



International Carriage of Dangerous Goods by Inland Waterways (AND)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (1,1-DIPHENYLETHANE AND DIPHENYL OXIDE MIXTURE)
Transport hazard class: 9
Packing group: III

International Carriage of Dangerous Goods by Rail (RID)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (1,1-DIPHENYLETHANE AND DIPHENYL OXIDE MIXTURE)
Transport hazard class: 9
Packing group: III

International Carriage of Dangerous Goods by Road (ADR)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (1,1-DIPHENYLETHANE AND DIPHENYL OXIDE MIXTURE)
Transport hazard class: 9
Packing group: III

International Civil Aviation Organization (ICAO)

Not regulated

International Maritime Dangerous Goods Code (IMDG Code)

UN Number: UN3082
UN Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (1,1-DIPHENYLETHANE AND DIPHENYL OXIDE MIXTURE)
Transport hazard class: 9
Packing group: III
Packing: P001; LP01 (PP1)
IBCs: IBC03
Tanks: T4 (TP1, TP29)
MARPOL73/78 and IBC Code: P
Emergency schedules (EmS): F-A, S-F
Special provisions: 274; 335; 969

SECTION 15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Australia Inventory (AICS)

All the ingredients are listed.

California Proposition 65

This product does not contain any chemicals known to the State of California to cause cancer and/or to cause birth defects or other reproductive harm.

Canadian Domestic Substances List/Non-Domestic Substances List (DSL/NDL)

All the ingredients are listed.

China Inventory of Existing Chemical Substances (IECSC)

All the ingredients are listed.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quantity

This product is not reportable under 40 CFR Part 302.4.

International Agency for Research on Cancer (IARC)

None of the ingredients are listed.

Japan Existing and New Chemical Substances (ENCS)

All the ingredients are listed.



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Korean Existing and Evaluated Chemical Substances (KECL)

All the ingredients are listed.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All the ingredients are listed.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR Part 355)

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA Title III Section 313 (40 CFR Part 372)

This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

SARA Title III Sections 311/312 Hazardous Categorization (40 CFR Part 370)

Hazardous categories for this product are:

Acute = Yes Chronic = No Fire = No Pressure = No Reactive = No

United States Toxic Substances Control Act (TSCA)

All the ingredients are listed.

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been conducted.

SECTION 16.

Safety Data Sheet Creation Date: 10 December 1999

Safety Data Sheet Revision Date: 6 October 2017

Revision Number: 4.0

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 INFORMATION STATED IS TO THE BEST OF RADCO'S KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE TO ITS ACCURACY, RELIABILITY, OR COMPLETENESS, AND RADCO DOES NOT ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION. FINAL DETERMINATION OF SUITABILITY OF ANY MATERIAL IS THE SOLE RESPONSIBILITY OF THE USER. ALL MATERIAL SHOULD BE USED WITH CAUTION TO GUARD AGAINST UNKNOWN HAZARDS. ALTHOUGH CERTAIN HAZARDS ARE DESCRIBED HEREIN, RADCO DOES NOT GUARANTEE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

XCELTHERM® is a registered trademark of Radco Industries, Inc.

Toxicological References

"1,1-Diphenylethane." *National Center for Biotechnology Information. PubChem Compound Database.* U.S. National Library of Medicine. Web. 22 May 2017.

"Diphenyl Ether." *Registration Dossier.* European Chemicals Agency, 12 Apr. 2017. Web. 22 May 2017.

Definitions

ACGIH	American Conference of Governmental Industrial Hygienists
Aquatic Acute 1	Aquatic hazard, acute toxicity, category 1
EC number	European Community number
EC ₅₀	Concentration that effects 50% of the test population.
EU	European Union
Eye Irrit. 2	See <i>Eye irritation, category 2 definition.</i>
H319	Causes serious eye irritation
H400	Very toxic to aquatic life
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
LC ₅₀	Lethal concentration that causes 50% death in test population.
LD ₅₀	Lethal dose that causes 50% death in test population.
NFPA	National Fire Protection Association
NOAEL	No observed adverse effect level



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NTP	National Toxicology Program, United States Department of Health and Human Services
OECD	Organisation for Economic Co-operation and Development
OECD 201	OECD Guideline 201: Freshwater Alga and Cyanobacteria, Growth Inhibition Test
OECD 202	OECD Guideline 202: Daphnia sp. Acute Immobilisation Test
OECD 203	OECD Guideline 203: Fish, Acute Toxicity Test
OECD 301D	OECD Guideline 301D: Ready Biodegradability Closed Bottle
OECD 404	OECD Guideline 404: Acute Dermal Irritation/Corrosion
OECD 406	OECD Guideline 406: Skin Sensitization Test
OECD 414	OECD Guideline 414: Prenatal Development Toxicity Study
OECD 422	OECD Guideline 422: Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test
OECD 471	OECD Guideline 407: Bacterial Reverse Mutation Test
OSHA	United States Department of Labor Occupational Safety and Health Administration
PBT	Persistence Bioaccumulation and Toxicity