# XCELTHERM® Electrical Insulating Oil, Type 1 (EIO-I)

## Safety Data Sheet

### ASTM D3487-09 TYPE I Standard Specification for Mineral Insulating Oil Used in Electrical Apparatus

Issue date: 4/21/2011 Revision date: 9/26/2025 Supersedes: 9/13/2024 Version: 4.0

*according to 29 CFR § 1910.1200, Hazard Communication Standard (HCS)*

## SECTION 1: Identification

### 1.1. Identification

| | |
|---|---|
| Trade name | XCELTHERM® Electrical Insulating Oil, Type 1 (EIO-I) |
| Radco Product Code: | XEIO TYPE I (11111-A) |
| Specification: | ASTM D3487-09 Type I Standard Specification for Mineral Insulating Oil Used in Electrical Apparatus |
| National Stock Number(s) (NSN): | 9160-00-685-0913 (5 Gallon Pail)<br>9160-00-685-0914 (55 Gallon Drum) |

### 1.2. Recommended use and restrictions on use

| | |
|---|---|
| Use of the substance/mixture: | Meets military standard specifications for electrical oil applications. XCELTHERM® EIO-I has high electrical resistance and is both thermally and oxidatively stable. XCELTHERM® EIO-I is intended for use in most common electrical insulating oil applications where normal oxidation resistance is required. |

### 1.3. Supplier

Radco Industries L.L.C.
CAGE Code 6ZS16
700 Kingsland Drive
Batavia, Illinois 60510
United States
T (630) 232-7966
www.radcoind.com

### 1.4. Emergency telephone number

| | |
|---|---|
| Emergency number: | For Chemical Emergency Call CHEMTREC 24hr/day 7days/week<br>Within USA and Canada: 1-800-424-9300<br>Outside USA and Canada: +1 703-741-5970<br>(collect calls accepted) |

## SECTION 2: Hazard(s) identification

### 2.1. Classification of the substance or mixture

**GHS US classification**

| | | |
|---|---|---|
| Aspiration hazard, Category 1 | H304 | May be fatal if swallowed and enters airways. |

Full text of H statements : see section 16

### 2.2. GHS Label elements, including precautionary statements

**GHS US labeling**

Hazard pictograms (GHS US):

Signal word (GHS US): Danger

Hazard statements (GHS US): H304 - May be fatal if swallowed and enters airways

Precautionary statements (GHS US): P301+P310 - If swallowed: Immediately call a POISON CENTER, a doctor.
P331 - Do NOT induce vomiting.
P405 - Store locked up.
P501 - Dispose of contents and container to an approved waste disposal plant.

### 2.3. Other hazards which do not result in classification

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

| Name | CAS-No. | % | GHS US classification |
|---|---|---|---|
| Distillates (petroleum), hydrotreated light paraffinic | 64742-55-8 | 0 – 45 | Not classified |
| Distillates (petroleum), hydrotreated light naphthenic | 64742-53-6 | ≥ 30 | Asp. Tox. 1, H304 |
| 2,6-Di-tert-butyl-p-cresol | 128-37-0 | < 0.3 | Acute Tox. 4 (Inhalation:dust,mist), H332<br>STOT RE 2, H373<br>Aquatic Chronic 1, H410 |

Full text of hazard classes and H-statements : see section 16

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures general: Call a physician immediately.

First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing.

First-aid measures after skin contact: Wash skin with plenty of water.

First-aid measures after eye contact: Rinse eyes with water as a precaution.

First-aid measures after ingestion: Do not induce vomiting. Call a physician immediately.

### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation: Although no appropriate human or animal health effects data are known to exist, this material is expected to be an inhalation hazard.

Symptoms/effects after skin contact: None under normal conditions.

Symptoms/effects after eye contact: None under normal conditions.

Symptoms/effects after ingestion: Risk of lung edema.

### 4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

| | |
|---|---|
| Suitable extinguishing media: | Water spray. Dry powder. Foam. Carbon dioxide. |
| Unsuitable extinguishing media: | Do not use a heavy water stream. |

### 5.2. Specific hazards arising from the chemical

| | |
|---|---|
| Fire hazard: | No fire hazard. |
| Explosion hazard: | No direct explosion hazard. |
| Hazardous decomposition products in case of fire: | Toxic fumes may be released. |

### 5.3. Special protective equipment and precautions for fire-fighters

| | |
|---|---|
| Firefighting instructions: | Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection. |
| Protection during firefighting: | Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing. |

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

| | |
|---|---|
| General measures: | Stop leak if safe to do so. Notify authorities if product enters sewers or public waters. Absorb spillage to prevent material-damage. |

#### 6.1.1. For non-emergency personnel

| | |
|---|---|
| Protective equipment: | Wear recommended personal protective equipment. |
| Emergency procedures: | Ventilate spillage area. |

#### 6.1.2. For emergency responders

| | |
|---|---|
| Protective equipment: | Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection". |
| Emergency procedures: | Evacuate unnecessary personnel. Stop leak if safe to do so. |

### 6.2. Environmental precautions

Avoid release to the environment.

### 6.3. Methods and material for containment and cleaning up

| | |
|---|---|
| For containment: | Absorb spilled material with sand or earth. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Stop leak, if possible without risk. |
| Methods for cleaning up: | Take up liquid spill into absorbent material. |
| Other information: | Dispose of materials or solid residues at an authorized site. |

### 6.4. Reference to other sections

For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

| | |
|---|---|
| Additional hazards when processed: | Not expected to present a significant hazard under anticipated conditions of normal use. |
| Precautions for safe handling: | Ensure good ventilation of the work station. Wear personal protective equipment. |
| Hygiene measures: | Do not eat, drink or smoke when using this product. Always wash hands after handling the product. |

### 7.2. Conditions for safe storage, including any incompatibilities

| | |
|---|---|
| Technical measures: | Keep in a cool, well-ventilated place away from heat. |
| Storage conditions: | Store locked up. |
| Packaging materials: | Store always product in container of same material as original container. |

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

| **XCELTHERM® Electrical Insulating Oil, Type 1 (EIO-I)** | |
|---|---|
| No additional information available | |
| **USA - ACGIH - Occupational Exposure Limits** | |
| Local name | Butylated hydroxytoluene |
| ACGIH® TLV® TWA | 2 mg/m³ (IFV - Inhalable fraction and vapor) |
| Remark (ACGIH) | TLV® Basis: URT irr. Notations: A4 (Not classifiable as a Human Carcinogen) |
| Regulatory reference | ACGIH 2025 |

| **Distillates (petroleum), hydrotreated light naphthenic (64742-53-6)** |
|---|
| No additional information available |

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** | |
|---|---|
| No additional information available | |
| **USA - ACGIH - Occupational Exposure Limits** | |
| Local name | Mineral oil, excluding metal working fluids Pure, highly and severely refined |
| ACGIH® TLV® TWA | 5 mg/m³ (I - Inhalable particulate matter) |
| Remark (ACGIH) | TLV® Basis: URT irr. Notations: A4 (Not classifiable as a Human Carcinogen) |
| Regulatory reference | ACGIH 2025 |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** | |
|---|---|
| No additional information available | |
| **USA - ACGIH - Occupational Exposure Limits** | |
| Local name | Butylated hydroxytoluene |
| ACGIH® TLV® TWA | 2 mg/m³ |

| | |
|---|---|
| Remark (ACGIH) | TLV® Basis: URT irr. Notations: A4 (Not classifiable as a Human Carcinogen) |
| Regulatory reference | ACGIH 2025 |

### 8.2. Appropriate engineering controls

Appropriate engineering controls: Ensure good ventilation of the work station.
Environmental exposure controls: Avoid release to the environment.

### 8.3. Individual protection measures/Personal protective equipment

**Personal protective equipment:**
Wear recommended personal protective equipment.

| **Hand protection:** |
|---|
| Protective gloves |

| **Eye protection:** |
|---|
| Safety glasses |

| **Skin and body protection:** |
|---|
| Wear suitable protective clothing |

| **Respiratory protection:** |
|---|
| In case of insufficient ventilation, wear suitable respiratory equipment |

**Personal protective equipment symbol(s):**

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

| | |
|---|---|
| Physical state: | Liquid |
| Appearance: | Liquid. |
| Color: | Colorless to light yellow |
| Odor: | Characteristic odor |
| Odor threshold: | No data available |
| pH: | No data available |
| Melting point: | Not applicable |
| Freezing point: | ≤ -40 °C Pour point |
| Boiling point: | No data available |

| | |
|---|---|
| Flash point: | > 145 °C Cleveland Open Cup Method |
| Relative evaporation rate (butyl acetate=1): | No data available |
| Flammability: | No data available |
| Vapor pressure: | < 1 mm Hg |
| Relative vapor density at 20°C: | > 5 at 101 kPa (Air = 1) |
| Relative density: | 0.88 – 0.89 at 15.6°C |
| Density: | 7.38 lb/gal at 15.6°C (Water = 1) |
| Solubility: | No data available |
| Partition coefficient n-octanol/water (Log Pow): | No data available |
| Auto-ignition temperature: | No data available |
| Decomposition temperature: | No data available |
| Viscosity, kinematic: | 9 – 12 $mm^2/s$ at 40°C |
| Viscosity, dynamic: | No data available |
| Explosion limits: | No data available |
| Explosive properties: | No data available |
| Oxidizing properties: | No data available |

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

| | |
|---|---|
| Acute toxicity (oral): | Not classified |
| Acute toxicity (dermal): | Not classified |
| Acute toxicity (inhalation): | Not classified |
| Skin corrosion/irritation: | Not classified |
| Carcinogenicity: | Not classified |
| Aspiration hazard: | May be fatal if swallowed and enters airways. |
| Viscosity, kinematic: | 9 – 12 $mm^2/s$ at 40°C |
| Symptoms/effects after inhalation: | Although no appropriate human or animal health effects data are known to exist, this material is expected to be an inhalation hazard. |
| Symptoms/effects after skin contact: | None under normal conditions. |
| Symptoms/effects after eye contact: | None under normal conditions. |
| Symptoms/effects after ingestion: | Risk of lung edema. |
| STOT-single exposure: | Not classified |
| STOT-repeated exposure: | Not classified |
| Reproductive toxicity: | Not classified |

| **Distillates (petroleum), hydrotreated light naphthenic (64742-53-6)** | |
|---|---|
| LD50 oral rat: | > 5000 mg/kg body weight (OECD 401 method) (OECD 420 method) |

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** | |
|---|---|
| LD50 oral rat: | > 5000 mg/kg body weight (OECD 401 method) |
| LD50 dermal rabbit: | > 2000 mg/kg IUCLID reference substance |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** | |
|---|---|
| LD50 oral rat: | > 2930 mg/kg body weight (OECD 401 method) |
| LD50 dermal rat: | > 2000 mg/kg body weight (OECD 402 method) |
| LD50 dermal rabbit: | > 2000 mg/kg Source: ECHA |
| ATE US (dust, mist): | 1.5 mg/l/4h |

| **Distillates (petroleum), hydrotreated light naphthenic (64742-53-6)** | |
|---|---|
| Serious eye damage/irritation: | Not classified |

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** | |
|---|---|
| Serious eye damage/irritation: | Not classified |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** | |
|---|---|
| Serious eye damage/irritation: | Not classified |

| **Distillates (petroleum), hydrotreated light naphthenic (64742-53-6)** | |
|---|---|
| Respiratory or skin sensitization: | Not classified |

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** | |
|---|---|
| Respiratory or skin sensitization: | Not classified |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** | |
|---|---|
| Respiratory or skin sensitization: | Not classified |

| **Distillates (petroleum), hydrotreated light naphthenic (64742-53-6)** | |
|---|---|
| Germ cell mutagenicity: | Not classified |

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** | |
|---|---|
| Germ cell mutagenicity: | Not classified |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** | |
|---|---|
| Germ cell mutagenicity: | Not classified |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** | |
|---|---|
| NOAEL (chronic,oral,animal/male,2 years): | 25 mg/kg body weight rat |
| IARC group: | 3 - Not classifiable |

| **Distillates (petroleum), hydrotreated light naphthenic (64742-53-6)** | |
|---|---|
| LOAEL (oral,rat,90 days): | 125 mg/kg body weight male (OECD 408 method) |
| NOAEL (dermal,rat/rabbit,90 days): | 1000 mg/kg body weight (OECD 410 method) |

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** | |
|---|---|
| LOAEL (oral,rat,90 days): | 125 mg/kg body weight (OECD 408 method) |
| NOAEC (inhalation,rat,dust/mist/fume,90 days): | > 0.98 mg/l Air (OECD 412 method) |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** | |
|---|---|
| NOAEL (oral,rat,90 days): | 25 mg/kg body weight Affects the liver |
| STOT-repeated exposure: | May cause damage to organs through prolonged or repeated exposure. |

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general: The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** | |
|---|---|
| LC50 - Fish [1]: | > 5000 mg/l IUCLID reference substance |
| EC50 - Crustacea [1]: | > 1000 mg/l (IUCLID reference substance) |

| 2,6-Di-tert-butyl-p-cresol (128-37-0) | |
|---|---|
| LC50 - Fish [1]: | 0.57 mg/l Species: Danio rerio (previous names: Brachydanio rerio (zebra-fish)) |
| EC50 - Crustacea [1]: | 0.48 mg/l Species: Daphnia magna (Water flea) |
| LOEC (chronic): | 1 mg/l Species: Daphnia magna (Water flea) (21 days) |
| NOEC (chronic): | 0.023 mg/l Species: Daphnia magna (Water flea) (21 days) |
| NOEC chronic fish: | 0.053 mg/l Species: Oryzias latipes (Ricefish) (42 days) |

### 12.2. Persistence and degradability

| 2,6-Di-tert-butyl-p-cresol (128-37-0) | |
|---|---|
| Persistence and degradability: | Not readily biodegradable in water. |
| Biochemical oxygen demand (BOD): | 0.51 g $O_2$/g substance |
| Chemical oxygen demand (COD): | 2.27 g $O_2$/g substance |
| ThOD: | 2.977 g $O_2$/g substance |

### 12.3. Bioaccumulative potential

| Distillates (petroleum), hydrotreated light paraffinic (64742-55-8) | |
|---|---|
| Partition coefficient n-octanol/water (Log Pow): | 3.9 – 6 (IUCLID reference substance) |

| 2,6-Di-tert-butyl-p-cresol (128-37-0) | |
|---|---|
| Partition coefficient n-octanol/water (Log Pow): | 5.1 |
| Bioaccumulative potential: | Potential for bioaccumulation (4 ≤ Log Kow ≤ 5). |

### 12.4. Mobility in soil

| 2,6-Di-tert-butyl-p-cresol (128-37-0) | |
|---|---|
| Surface tension: | Not applicable (Water solubility < 1 mg/l) |
| Organic Carbon Normalized Adsorption Coefficient (Log Koc): | 4.4 (Source: PCKOCWIN v1.66 (calculated value)) |
| Ecology - soil: | Potential for mobility in soil is slight. May be harmful to plant growth, blooming and fruit formation. |

### 12.5. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

Regional waste regulation: Disposal must be done according to official regulations.

| | |
|---|---|
| Waste treatment methods: | Dispose of contents/container in accordance with licensed collector's sorting instructions. |
| Sewage disposal recommendations: | Disposal must be done according to official regulations. |
| Product/Packaging disposal recommendations: | Disposal must be done according to official regulations. |
| Additional information: | Do not re-use empty containers. |

## SECTION 14: Transport information

In accordance with DOT / TDG / IMDG / IATA / ICAO / ADN / RID / ADG

### 14.1. UN number

Not regulated for transport

### 14.2. UN proper shipping name

| | |
|---|---|
| Proper Shipping Name (DOT): | Not applicable |
| Proper Shipping Name (TDG): | Not applicable |
| Proper Shipping Name (IMDG): | Not applicable |
| Proper Shipping Name (IATA): | Not applicable |

### 14.3. Transport hazard class(es)

**DOT**

Transport hazard class(es) (DOT): Not applicable

**TDG**

Transport hazard class(es) (TDG): Not applicable

**IMDG**

Transport hazard class(es) (IMDG): Not applicable

**IATA**

Transport hazard class(es) (IATA): Not applicable

### 14.4. Packing group

| | |
|---|---|
| Packing group (DOT): | Not applicable |
| Packing group (TDG): | Not applicable |
| Packing group (IMDG): | Not applicable |
| Packing group (IATA): | Not applicable |

### 14.5. Environmental hazards

Other information: No supplementary information available.

### 14.6. Special precautions for user

**DOT**

No data available

**TDG**

No data available

**IMDG**
No data available

**IATA**
No data available

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

Not applicable

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

All components of this product are present and listed as Active on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture is not known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

### 15.2. International regulations

**CANADA**

| **Distillates (petroleum), hydrotreated light naphthenic (64742-53-6)** |
|---|
| Listed on the Canadian DSL (Domestic Substances List) |

| **Distillates (petroleum), hydrotreated light paraffinic (64742-55-8)** |
|---|
| Listed on the Canadian DSL (Domestic Substances List) |

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** |
|---|
| Listed on the Canadian DSL (Domestic Substances List) |

**EU-Regulations**

No additional information available

**National regulations**

| **2,6-Di-tert-butyl-p-cresol (128-37-0)** |
|---|
| Listed on INSQ (Mexican National Inventory of Chemical Substances) |

### 15.3. US State regulations

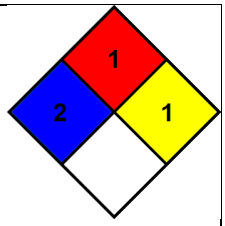
California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

## SECTION 16: Other information

according to 29 CFR § 1910.1200, Hazard Communication Standard (HCS)
Revision date: 09/26/2025

| **Full text of hazard classes and H-statements** | |
|---|---|
| H304 | May be fatal if swallowed and enters airways |
| 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 |

| | |
|---|---|
| NFPA health hazard | 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. |
| NFPA fire hazard | 1 - Materials that must be preheated before ignition can occur. |
| NFPA reactivity | 1 - Materials that in themselves are normally stable but can become unstable at elevated temperatures and pressures. |




| Hazard Rating | |
|---|---|
| Health | 2 Moderate Hazard - Temporary or minor injury may occur |
| Flammability | 1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB) |
| Physical | 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives. |

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 particular process or for any particular purpose. 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, purchasers, users and distributors are not relying on any promise, representation, or recommendation made by Radco, 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.