Soltex, Inc.
281-587-0900
www.soltexinc.com

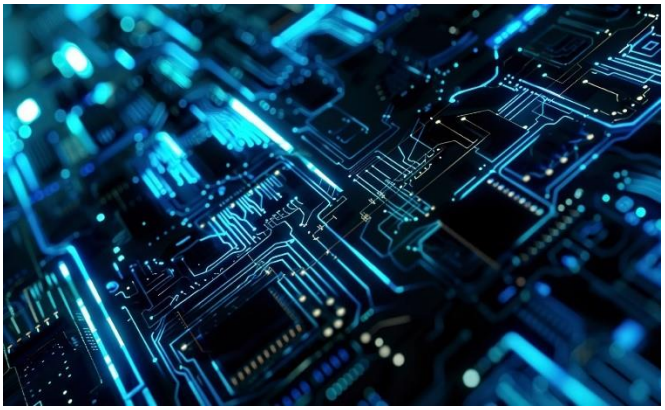
Opticool Fluids

Application and Handling Guide

Contents

Soltex, Inc: An Introduction:

Soltex, Inc. makes oils that cool electrical circuits. Our oils are used in many industries to provide cooling and electrical insulation solutions. Our oils cool power-dense electronic circuits and high torque DC automotive motors. We help companies make better and safer electric batteries. Soltex's oils lower the operating costs of power transformers and protect them against fire and explosion. Our oils cool military and aerospace computers, F1 auto motors, robots, and underwater vehicles. Our highly biodegradable oils can be used in environmentally sensitive applications.

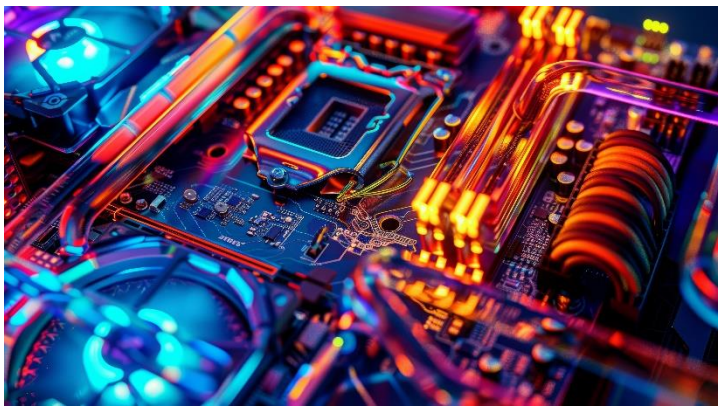


You'll find Soltex wherever electrical circuits are cooled.

Soltex continually develops and introduces new products to take advantage of new materials and to address specific customer and market needs.

With a line of environmentally safe, highly efficient products,
Soltex is positioned to be the leading company in electrical circuit cooling.

Soltex OptiCool Fluids provide cooling efficiency, safety and thermal stability at a low cost. They are designed for use in circulating heating and cooling systems in electrical applications. Several are specially formulated for low temperature/low viscosity applications. Soltex OptiCool Heat Transfer Fluids are also used in a wide variety of applications worldwide and have a proven record of success under demanding conditions.



Completely non-aromatic, nontoxic and safe to use, Soltex OptiCool heat transfer fluids are odorless and clean. They have very low vapor pressures in their intended application range.
Soltex OptiCool heat transfer fluids have low volatility, good lubricity, and excellent dielectric characteristics. They are highly resistant to oxidation and corrosion.

Soltex OptiCool Fluids are designed to meet the tough demands that users have on heat transfer fluids. The physical properties of these hydrocarbon fluids provide extra long life in difficult applications.

Soltex has been a leader in heat transfer and dielectric fluids since 1992. Our products are manufactured under strict quality control at our ISO-9002:2008 certified facilities. OptiCool Heat Transfer Fluids meet the highest industry standards.

SOLTEX OPTICOOL® FLUIDS

FEATURES AND BENEFITS OF SOLTEX OPTICOOL HEAT TRANSFER FLUIDS:

Made from synthetic hydrocarbon fluids	Better safety, oxidation stability and heat
transfer Non-Toxic and biodegradable	Safer for users and for the environment
Low cost	Provides affordable safety and efficiency
High dielectric strength	Safety in electrical insulating applications
Excellent oxidation stability	Long service life with less maintenance required
Easy Maintenance Procedure	Soltex OptiCool Fluids are easily tested materials
Compatible with standard equipment construction	Use standard gaskets, pipes, hoses and filters
Low Volatility	No fumes or smell, and extra fire safety

SOLTEX OPTICOOL® HEAT TRANSFER FLUIDS

	OptiCool	OptiCool PH5	OptiCool-H	OptiCool-A	OptiCool-872552
Special Characteristics	Excellent heat transfer, & material compatibility	Higher flash point while maintains low viscosity	Excellent biodegradation, low toxicity, lowest viscosity	Best oxidation resistance and long-term stability.	**Extremely low pour points; excellent low temperature fluidity**
Applications	Electrical and Electronics cooling, vacuum tubes, VHF and RF transmission equipment	Electronics cooling and industrial process heat and cooling	Underwater hydraulics, ROV control, electrical insulation and heat transfer	Automotive electrical insulation, heat transfer and hydraulics	**Aerospace and military applications requiring conformance with MIL Spec 87252**
Base Oil	Hydrotreated Paraffin	Hydroisomerized Paraffin	Hydrotreated Paraffin	Synthetic PAO	**Synthetic PAO**
Useful Temp Range	-35 – 250 °C	-12 – 250 C	-50 – 250 °C	-52 – 250°C	**-61 – 250 °C**
Color:	Clear	Clear	Clear	Clear	**Clear**
Viscosity, cSt,					
100 C	2.64	1.80	1.40	2.00	**1.70**
40 C	9.84	5.72	3.70	6.40	**5.00**
Pour Point, °C	-39	-12	-55	-57	**-66**
Flash Point, COC, °C	185	151	135	147	**160**
Density, g/cc @ 16 C.	0.831	.855	0.825	0.799	**0.798**
Thermal Conductivity, W/m*K					
0 °C	0.1395	01389	0.1370	0.1381	**0.1381**
40°C	0.1372	0.1363	0.1346	0.1358	**0.1358**
100 °C	0.1338	0.1333	0.1344	0.1323	**0.1323**
Specific Heat, J/g*K					
0 °C	2.053	2.054	2.055	2.054	**2.054**
40 °C	2.203	2.203	2.206	2.205	**2.205**
100 °C	2.428	2.430	2.432	2.430	**2.430**
Coefficient of Thermal Expansion, /°C	**0.00065**	**0.00065**	**0.0007**	**0.000647**	**0.000673**

The information shown is typical of Soltex OptiCool Fluid products, and is not intended to be used as a specification. For more detailed information, please contact Soltex, Inc.

Viscosity-Temperature Relationships for OptiCool Fluids

	OptiCool	OptiCool PH5	OptiCool-H	OptiCool-A	OptiCool 87252
Temperature, C	Kinematic Viscosity, cSt.				
150 C	1.40	1.01	***	1.13	0.99
140 C	1.56	1.12	***	1.24	1.04
130 C	1.75	1.25	1.01	1.38	1.20
120 C	1.99	1.40	1.12	1.55	1.34
110 C	2.27	1.58	1.25	1.75	1.50
100 C	2.64	1.80	1.40	2.00	1.70
90 C	3.11	2.08	1.59	2.31	1.95
80 C	3.72	2.44	1.82	2.72	2.27
70 C	4.56	2.91	2.11	3.25	2.27
60 C	5.72	3.55	2.49	3.97	3.22
50 C	7.37	4.43	3.00	4.97	3.96
40 C	9.84	5.71	3.70	6.40	5.00
30 C	13.7	7.59	4.68	8.53	6.52
20 C	20.0	10.6	6.11	11.9	8.82
10 C	31.1	15.8	8.31	17.0	12.5
0 C	52.2	24.3	11.9	27.2	18.8
-10 C	96.4	41.3	18.1	46.1	30.4
-20 C	200.7	***	29.6	86.7	53.9
-30 C	486.2	***	53.7	185.4	107.5
-40 C	***	***	110.5	468.0	249.3
-50 C	***	***	268.5	1463.0	702.0
-60 C	***	***	***	***	2547.2

Elemental Analysis:

Soltex's products are based on hydrocarbon base oils. The base oil's only constituent elements are hydrogen and carbon. Additives used in Soltex's heat transfer fluid products are "ashless" and do not contain metals, halogens or phosphates.

Stability and Influence of Moisture

OptiCool fluids are nearly 100% hydrocarbon and are stable in the presence of moisture. All Soltex dielectric fluids adsorb moisture from the air and other porous insulation at about the same rate as conventional mineral transformer oil. At 20 C., it takes about 80 ppm of water to saturate OptiCool Fluids – about the same as for standard mineral oil.

Compatibility with Equipment Construction Materials

Soltex products are tested and proven compatible with all equipment construction materials that are used with conventional mineral oil. They are less aggressive to paints, varnishes, rubbers, and other materials than conventional oil. Soltex fluids are compatible with all gasket materials that are commonly used with conventional mineral transformer oil.

Some of these materials that are often used are:

Nitrile Rubber Silicone Rubber Buna-n Rubber

Viton Fluorocarbon Rubber

PVC Wire Insulation Most types of circuit board resins and laminates All metals

OptiCool Fluids have been used with many types of phenolic, epoxy and formaldehyde resins. Both conventional and high-temperature solid insulation have been used in equipment filled with OptiCool Fluids. Soltex recommends that any materials chosen be tested for compatibility before use with OptiCool Fluids.

RECEIPT AND HANDLING OF OPTICOOL FLUID

Fluid Characteristics:

OptiCool Fluid received from Soltex, or a distributor should meet the following characteristic to be considered acceptable for use:

Characteristic	Value
Color, ASTM Units, ASTM D1500:	0.5 max
Dielectric Strength, ASTM D1816, (1 mm gap) kV:	25 minimum
Dissipation Factor@25°C, ASTM D924, %	0.05
maximum Moisture Content, ppm, ASTM D1533b	35 max
Kinematic Viscosity @ 100 C, D88, cSt	3.0 max

Contact Soltex, Inc. (281-587-0900) for more information on OptiCool Fluid characteristics or specifications.

Shipping Containers:

Soltex's fluids are available in five-gallon containers, 55 gallon drums, 275 gallon "tote" containers, or tank trailers. Each type of shipping container should be handled according to standard industry practice in order to ensure that the fluid will retain its original characteristics.

Receipt and Inspection of Shipments:

The receipt and inspection of dielectric fluids should follow standard industry practice. Dielectric fluids should be sampled with great care, in clean, glass containers, in order to minimize the possibility of contamination with water, dirt, other oils or greases. ASTM D943, while addressing sampling of power transformers, remains a definitive authority on the subject of sampling procedure. Contact Soltex with any questions.

For bulk shipments, test and inspect the fluid before the fluid is unloaded. For

shipments received in drums, a representative sample should be taken from several of the drums and blended together.

The sample should be taken in a clean, clear, dry glass jar. If the fluid does not meet the recommended acceptance values shown above, contact Soltex, Inc. immediately.

For recommendations regarding types of hoses or pumps to be used with our oil products, please contact Soltex, Inc.

Fluid Storage and Drum Handling:

When OptiCool Fluids are to be stored for a long period of time, store them in a dry, heated building. Outdoors, drums should be stored horizontally, with the bungs below the internal oil level. A drip pan or curb around the storage area should be used to contain any fluid from a ruptured or leaking container. Totes should be covered. Pails should always be stored indoors.

Installing OptiCool Fluids Into Equipment

Normally, OptiCool Fluid is simply poured or pumped directly into equipment that it is designed to cool.

In most cases, filtration of OptiCool Fluid is not necessary. Soltex products are filtered many times during the manufacturing process. If there is any reason to believe that the stored OptiCool Fluid has become wet, the oil should be vacuum dried before introducing it into equipment.

Maintenance of Soltex OptiCool Fluid in Service

Periodic maintenance testing on OptiCool Fluid should be performed Contact Soltex for recommendations regarding continued use of service-aged OptiCool Fluid.

OptiCool Fluids can be reconditioned in the same manner as other hydrocarbon oils. This process cleans oil that has been oxidized or contaminated with water, arc decomposition products or other matter Use the same types of equipment and the same methods as with conventional transformer oil.

Water can be removed from insulating oils with a centrifuge, vacuum dehydrators or moisture absorbing filters. Particulate matter may be removed by filtration through a filter with a small pore size (0.5 micron). For specific recommendations regarding reclamation processes for hydrocarbon- based dielectric fluids, consult Soltex.

SAFETY AND ENVIRONMENTAL INFORMATION

Biodegradation: OptiCool Fluids are each >90% biodegradable in standard 28-day tests, making them "Intrinsically Biodegradable". Soltex's dielectric fluids contain no hazardous or toxic substances such as halogens or metallic compounds. They are saturated hydrocarbons, which is one of the simplest and fastest types of compounds to biodegrade. The fluids do not contain carcinogenic substances.

Soltex products have an extremely low Global Warming Potential (GWP).

Spill Control Information:

If a spill of any fluid occurs on land, contain the spilled material with dikes of earth, sand or commercially available spill control pillows. Scoop up excess oil and dispose of it properly. (Put the saturated pillows or sand into drums and have them taken away by a firm licensed to dispose of wastes).

Toxicity:

OptiCool Fluids are virtually non-toxic. These types of oils are neither mutagenic nor carcinogenic. Testing effects indicate that they pose little risk to personnel when handled with normal handling procedures. LD_{50} values are over 40 grams per kilogram of bodyweight.

Skin contact testing has shown that OptiCool fluids have little effect on intact or abraded skin. Some people experience a slight allergic irritation to oils, which makes their skin redden.

Inhalation of oil mist can irritate your lungs. We advise you to take conventional industry precautions against inhalation of mist or vapors, just as you would be with any oil product.

Spills of OptiCool Fluids are <u>not</u> required to be reported to CERCLA.

A spill of any oil on water should be contained with floating dikes and removed with oil-skimmers and wringing equipment. If enough oil is spilled that is visible on the surface of a navigable waterway, the U.S. Coast Guard must be notified. Carbon-ingesting microbes can help to speed the cleaning of an oil spill site. To report a spill, call the National Response Center (a Federally funded office) at 1-800-424-8802.

References and Notes:

1. Product characteristics shown in this Guide are considered “typical” of Soltex current production. Contact Soltex for more information and for sales specifications.

Appendix 1: Safety Data Sheet

The Safety Data Sheet that follows is not guaranteed to be the most up to date. It's provided only to give the reader an idea of hazards involved.
For the most up to date SDS for OptiCool Fluid, please visit:

https://soltexinc.com/wp-content/uploads/2024/05/OptiCool-SDS-GHS-10-10-23.pdf

SAFETY DATA SHEET

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

1.1. PRODUCT IDENTIFIER

Product Name: **OptiCool-H Fluid**
Product Description: Synthetic Heat Transfer Fluid

1.2. RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

Intended Use: For use as a dielectric heat transfer fluid for electrical and electronic insulation and cooling

Identified Uses: Insulating fluid for electrical equipment; Cooling fluid for electronic circuits

Uses advised against: This product is not recommended for any industrial, professional or consumer use where this fluid is in contact with products to be ingested.

1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Supplier: **SOLTEX, INC.**
4 Waterway Square Place Suite 275
The Woodlands, TX 77380
USA

Product Technical Information: (281) 587-0900

Website: www.soltexinc.com

1.4. EMERGENCY TELEPHONE NUMBER

CHEMTREC (24 Hours) Telephone: (800) 424-9300

SECTION 2 HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Aspiration toxicant: Category1; H304: May be fatal if swallowed and enters airways.

2.2. LABEL ELEMENTS

Pictograms:

Signal Word: Danger

Hazard Statements:

H304: May be fatal if swallowed and enters airways. H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements:

P273: Avoid release to environment.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P331: Do NOT induce vomiting.
P405: Store locked up.
P501: Dispose of contents and container in accordance with local regulations.

Contains: hydrotreated petroleum oils

2.3. OTHER HAZARDS

Physical / Chemical Hazards:
No significant hazards.

Health Hazards:
High-pressure injection under skin may cause serious damage. Airborne low-viscosity petroleum oils can affect lungs.

Environmental Hazards:
No significant hazards. Material is not considered to be persistent, bioaccumulating nor toxic (PBT) nor considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

3.1. SUBSTANCES
This material is regulated as a mixture.

3.2. MIXTURES
This material is defined as a mixture

Reportable hazardous substance(s) complying with the classification criteria and/or with an exposure limit (OEL)

Name	CAS#	EC#	Registration#	Concentration w/w	GHS/CLP classification
Synthetic hydrotreated white mineral oil	8042-47-5	232-455-8	01-2119487078-27-0010	0 - 100%	Asp. Tox. 1, H304
3,5-di-tert butyl-4hydroxyhydrocinnamic acid, C7-9-branched alkyl esters	125643-61-0	406-040-9	01-0000015551-76-0000	0-2%	Aquatic Chronic 4 H413

Name	CAS#	EC#	Registration#	Concentration*	DSD Symbols/Risk Phrases
Synthetic hydrotreated white mineral oil	8042-47-5	232-455-8	1-2119487078-27-0010	0 - 100	Xn;R65
3,5-di-tert butyl-4hydroxyhydrocinnamic acid, C7-9-branched alkyl esters	125643-61-0	406-040-9	01-0000015551-76-0000	0-2%	Xn;R53

Note: See SDS Section 16 for full text of hazard statements and risk phrases.

SECTION 4 FIRST AID MEASURES

4.1. DESCRIPTION OF FIRST AID

MEASURES INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

4.2. MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Headache, dizziness, drowsiness, nausea and other CNS effects. Local necrosis as evidenced by delayed onset of pain and tissue damage a few hours after injection.

4.3. INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

SECTION 5 FIRE FIGHTING MEASURES

5.1. EXTINGUISHING MEDIA

Suitable Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unsuitable Extinguishing Media: Straight streams of water

5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Hazardous Combustion Products: Smoke, Fume, Incomplete combustion products, Oxides of carbon

5.3. ADVICE FOR FIRE FIGHTERS

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

FLAMMABILITY PROPERTIES

Flash Point [Method]: 135°C (275°F) [ASTM D-92]

Upper/Lower Flammable Limits (Approximate volume % in air): UEL: No data available LEL:

No data available

Autoignition Temperature: No data available

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY

PROCEDURES NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

6.2. ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

6.3. METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

Land Spill: Stop leak if you can do so without risk. Absorb or cover with dry earth, sand or other non- combustible material and transfer to containers. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

6.4. REFERENCES TO OTHER SECTIONS

See Section 6.1.

SECTION 7 HANDLING AND STORAGE

7.1. PRECAUTIONS FOR SAFE HANDLING

Avoid breathing mists or vapor. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or grounding procedures.
However, bonding and grounding may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabeled containers.

7.3. SPECIFIC END USES: Section 1 informs about identified end-uses. No industrial or sector specific guidance available.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. CONTROL

PARAMETERS EXPOSURE

LIMIT VALUES

Exposure limits/standards

Substance Name	Form	Limit/Standard			Note
Synthetic hydrotreated white mineral oil	Aerosols (thoracic fraction)	TWA	5 mg/m3		
3,5-di-tert butyl-4hydroxyhydrocinnamic acid, C7-9-branched alkyl esters	No data available				

DERIVED NO EFFECT LEVEL (DNEL)

Worker

Substance Name	Exposure	Value	Effects
Synthetic hydrotreated white mineral oil	Short term inhalation	4300 mg/m³	Systemic
	Long term dermal	2.9 mg/kg bw/day	Systemic
	Long term inhalation	68 mg/m³	Systemic

Consumer

Substance Name	Exposure	Value	Effects
Distillates (petroleum), hydrotreated light	Short term inhalation	2600 mg/m³	Systemic
	Long term	1.3 mg/kg bw/day	Systemic

	dermal Long term inhalation	20 mg/m³	Systemic

Summary: Long term systemic effects include non-reproductive effects and developmental/reproductive effects.

Lowest DNEL is shown.

8.2. EXPOSURE

CONTROLS

ENGINEERING

CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider: Adequate ventilation should be provided whenever the material is heated or mists are generated.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Particulate air-purifying respirator approved for dust or oil mist is recommended.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Chemical resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. >8 hours (breakthrough time): neoprene, nitrile, Viton®.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely

wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Color: Clear and Bright
Odor: Odorless or very mild petroleum like
Odor Threshold: No data available
pH: No data available
Melting Point: No data available
Freezing Point: No data available
Initial Boiling Point / and Boiling Range: No data available **Flash Point [Method]:** 135°C (275°F) [ASTM D-92] **Evaporation Rate (n-butyl acetate = 1):** No data available **Flammability (Solid, Gas):** Not applicaple
Upper/Lower Flammable Limits (Approximate volume % in air): UEL: No data available LEL: No data available
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available **Relative Density (at 15 °C):** 0.845 kg/L
Solubility(ies): water Negligible
Partition coefficient (n-Octanol/Water Partition Coefficient): No data available
Autoignition Temperature: No data available
Decomposition Temperature: No data available **Viscosity:** 3.7 cSt at 40ºC | 1.4 cSt at 100°C **Explosive Properties:** None
Oxidizing Properties: None

9.2. OTHER INFORMATION

Pour Point: -57°C (-71°F) [test method unavailable]

SECTION 10 STABILITY AND REACTIVITY

10.1. REACTIVITY: See sub-sections below.

10.2. CHEMICAL STABILITY: Material is stable under normal conditions.

10.3. POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

10.4. CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

10.5. INCOMPATIBLE MATERIALS: Strong oxidizers

10.6. HAZARDOUS DECOMPOSITION PRODUCTS: Carbon oxides.

SECTION 11 TOXICOLOGICAL INFORMATION

11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: (Rat) 4 hour(s) LC50 < 5 mg/l (Aerosol)	Moderately toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation (Rat): No end point data.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on test data for structurally similar materials.
Ingestion	
Acute Toxicity (Rat): LD50 > 2000 mg/kg Test scores or other study results do not meet criteria for classification.	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 401 420 423
Skin	
Acute Toxicity (Rabbit): LD50 > 5000 mg/kg Test scores or other study results do not meet criteria for classification.	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 402
Skin Corrosion/Irritation (Rabbit): Data available. Test scores or other study results do not meet criteria for classification.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404
Eye	
Serious Eye Damage/Irritation (Rabbit): Data available. Test scores or other study results do not meet criteria for classification.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
Sensitization	
Respiratory Sensitization: No end point data.	Not expected to be a respiratory sensitizer.
Skin Sensitization: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a skin sensitizer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406 429
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico- chemical properties of the material.
Germ Cell Mutagenicity: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 473 474 476
Carcinogenicity: No end point data.	Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
Reproductive Toxicity: Data available. Test scores or other study results do not meet criteria for classification.	Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 415
Lactation: No end point data.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No data available.	

OTHER INFORMATION

For the product itself:

Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Contains:

Hydrotreated petroleum oils: Acute exposures to high aerosol levels are harmful to lungs.

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

12.1. TOXICITY

Product/Ingrediant Name	Exposure	Organism Type	Test Results
Synthetic hydrotreated white mineral oil	-	Fish	NOEC 0.083 mg/l

12.2. PERSISTENCE AND DEGRADABILITY

Material -- Expected to be inherently biodegradable

12.3. BIOACCUMULATIVE POTENTIAL - Not determined.

12.4. MOBILITY IN SOIL - Not determined.

12.5. PERSISTENCE, BIOACCUMULATION AND TOXICITY FOR SUBSTANCE(S)
This product is not, or does not contain, a substance that is a PBT or a vPvB.

12.6. OTHER ADVERSE EFFECTS
No adverse effects are expected.

ECOLOGICAL DATA

Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	72 hour(s)	Alga	NOELR 1000 mg/l

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

13.1. WASTE TREATMENT METHODS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (ADR/RID): 14.1-14.6 Not Regulated for Land Transport

INLAND WATERWAYS (ADNR/ADN): 14.1-14.6 Not Regulated for Inland Waterways Transport

SEA (IMDG): 14.1-14.6 Not Regulated for Sea Transport according to IMDG-Code

SEA (MARPOL 73/78 Convention - Annex II):

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

Not classified according to Annex II

AIR (IATA): 14.1-14.6 Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Complies with the following national/regional chemical inventory requirements: IECSC, PICCS, ENCS, KECI, TSCA, DSL, AICS, NZIoC

SECTION 16	OTHER INFORMATION

List of abbreviations and acronyms that could be (but not necessarily are) used in this safety data sheet:

Acronym	Full text
AICS	Australian Inventory of Chemical Substances
ASTM	ASTM International, originally known as the American Society for Testing and Materials (ASTM) DSL Domestic Substance List (Canada)
EINECS	European Inventory of Existing Commercial Substances ELINCS European List of Notified Chemical Substances
ENCS	Existing and new Chemical Substances (Japanese inventory) IECSC Inventory of Existing Chemical Substances in China
KECI	Korean Existing Chemicals Inventory
NDSL	Non-Domestic Substances List (Canada)
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances
TLV	Threshold Limit Value (American Conference of Governmental Industrial Hygienists) TSCA Toxic Substances Control Act (U.S. inventory)
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials
LC	Lethal Concentration
LD	Lethal Dose
LL	Lethal Loading
EC	Effective Concentration
EL	Effective Loading
NOEC	No Observable Effect Concentration
NOELR	No Observable Effect Loading Rate

KEY TO THE RISK CODES CONTAINED IN SECTION 2 AND 3 OF THIS DOCUMENT (for information only):
R53; May cause long-term adverse effects in the aquatic environment. R65; Harmful: may cause lung damage if swallowed.

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
Asp. Tox. 1 H304: May be fatal if swallowed and enters airways;
Aquatic Chronic 4 H413: May cause long lasting harmful effects to aquatic life; Chronic Env Tox, Cat 4

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Safety Data Sheet updated in accordance with the provisions of OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200.

This Safety Data Sheet has been prepared by Soltex, Inc. in order to help the users of OptiCool fluid. The data contained herein is believed to be accurate, but no guarantees are given with regard to fitness of use in a particular situation.

Effective Date: January 2, 2012
Revision Date: August 4, 2014
Revised by David Childs