MATERIAL SAFETY DATA SHEET

Relatherm S-LT Low Temperature Silicone Heat Transfer Fluid

1. IDENTIFICATION

Product name: Relatherm S-LT Low Temperature Silicone Heat Transfer Fluid

Identified uses: Intended as a heat transfer fluid for closed-loop systems. For industrial use only.

Company: Relatherm Heat Transfer Fluids
P.O.Box 57874,
Jacksonville, FL, 32211

Customer Information Number: 904-687-2228

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 1-800-387-0406

2. HAZARDS IDENTIFICATION

Hazard classification
This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.
Flammable liquids - Category 3
Reproductive toxicity - Category 2

Label elements Hazard pictograms

Signal word: **WARNING!**

Hazards

Flammable liquid and vapor.
Suspected of damaging fertility or the unborn child.

Precautionary statements

Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment. Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF exposed or concerned: Get medical advice/ attention.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage

Store in a well-ventilated place. Keep cool. Store locked up.

Disposal

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

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: RELATHERM S-LT
This product is a mixture.

Component	CAS#	Concentration
Octamethyltrisiloxane	107-51-7	>= 25.0 - < 60.0 %
Decamethyltetrasiloxane	141-62-8	>= 25.0 - < 35.0 %
Octamethyl Cyclotetrasiloxane	556-67-2	>= 0.1 - < 1.0 %
Dodecamethylpentasiloxane	141-63-9	>= 15.0 - < 25.0 %

4. FIRST AID MEASURES

Description of first aid measures
General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: No emergency medical treatment necessary.

Skin contact: Wash off with plenty of water.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: Because rapid absorption may occur through the lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote.
Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Liquid mist of this product can burn. Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect

personnel and minimize property damage. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures: Vapor explosion hazard. Keep out of sewers. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Vapor explosion hazard. Keep out of sewers. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Material will float on water. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Small spills: Contain spilled material if possible. Absorb with materials such as: Cat litter. Sawdust. Vermiculite. Zorb-all®. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Avoid breathing vapor. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. This product is a poor conductor of electricity and can become electrostatically charged, even in bonded or grounded equipment. If sufficient charge is accumulated, ignition of flammable mixtures can occur.
Handling operations that can promote accumulation of static charges include but are not limited to mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. No smoking, open flames or sources of ignition in handling and storage area. Store in tightly closed container. Use only with adequate ventilation. Do not store in: Opened or unlabeled containers. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact. See Section 10 for more specific information.

Storage stability
Shelf life: Use within 60 Month

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below if they exist.

Component	Regulation	Type of listing	Value/Notation
Octamethyltrisiloxane	IHG	TWA	20 ppm
Decamethyltetrasiloxane	IHG	TWA	20 ppm
Octamethyl Cyclotetrasiloxane	US WEEL	TWA	10 ppm

Exposure controls
Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

Individual protection measures
Eye/face protection: Use safety glasses (with side shields).
Skin protection
Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. Examples of acceptable glove barrier materials include Natural rubber ("latex"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Other protection: Wear clean, body-covering clothing.
Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.
The following should be effective types of air-purifying respirators: Organic vapor cartridge.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Clear
Odor	Odorless to mild
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	Not applicable to liquids

Freezing point	< -101 °C (< -150 °F) *Literature*
Boiling point (760 mmHg)	Not applicable
Flash point	54 °C (130 °F) *Open Cup*
Evaporation Rate (Butyl Acetate = 1)	<0.3 *Estimated.*
Flammability (solid, gas)	Not applicable to liquids
Lower explosion limit	0.7 % vol *Literature*
Upper explosion limit	12.5 % vol *Literature*
Vapor Pressure	< 5 mmHg at 25 °C (77 °F) *Literature*
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	0.85 at 25 °C (77 °F) / 25 °C *Literature*
Water solubility	< 0.1 % *Literature*
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	350 °C (662 °F) *ASTM D2155*
Decomposition temperature	No test data available
Kinematic Viscosity	1.66 cSt at 20 °C (68 °F) *Literature*
Explosive properties	No data available
Oxidizing properties	No data available
Molecular weight	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No data available

Chemical stability: Thermally stable at typical use temperatures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Product can oxidize at elevated temperatures.

Incompatible materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Formaldehyde.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. Based on

information for component(s):
LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Based on information for component(s):
LD50, Rabbit, > 2,000 mg/kg Estimated. No deaths occurred at this concentration.

Acute inhalation toxicity
No adverse effects are anticipated from inhalation. Based on the available data, narcotic effects were not observed.
As product: The LC50 has not been determined.

Skin corrosion/irritation
Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation
May cause slight temporary eye irritation. Corneal injury is unlikely.
May cause mild eye discomfort.

Sensitization
Based on information for component(s):
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant information found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
For the minor component(s):
In animals, effects have been reported on the following organs:
Liver.

Carcinogenicity
Contains component(s) which did not cause cancer in laboratory animals.

Teratogenicity
Contains component(s) which did not cause birth defects or any other fetal effects in lab animals.

Reproductive toxicity
For the minor component(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. In animal studies, has been shown to interfere with fertility.

Mutagenicity
Contains a component(s) which were negative in in vitro genetic toxicity studies. Contains component(s) which were negative in animal genetic toxicity studies.

Aspiration Hazard
May be harmful if swallowed and enters airways.

COMPONENTS INFLUENCING TOXICOLOGY:

Octamethyltrisiloxane

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, vapour, > 22.6 mg/l No deaths occurred at this concentration.

Decamethyltetrasiloxane

Acute inhalation toxicity
LC50, Rat, 6 Hour, vapour, > 5,080 mg/l400 ppm No deaths occurred at this concentration.

Octamethyl Cyclotetrasiloxane

Acute inhalation toxicity
LC50, Rat, male and female, 4 Hour, dust/mist, 36 mg/l OECD Test Guideline 403

Dodecamethylpentasiloxane Acute inhalation toxicity
The LC50 has not been determined.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Octamethyltrisiloxane

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Toxicity to bacteria
For similar material(s):
EC50, activated sludge, static test, 3 Hour, Respiration rates., > 100 mg/l, OECD Test Guideline 209

Chronic toxicity to fish
No toxicity at the limit of solubility
NOEC, Oncorhynchus mykiss (rainbow trout), 90 d, > 0.027 mg/l

Chronic toxicity to aquatic invertebrates
No toxicity at the limit of solubility
NOEC, Daphnia magna (Water flea), flow-through test, 21 d, > 0.015 mg/l

Decamethyltetrasiloxane

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), flow-through, 96 Hour, > 0.0063 mg/l

Acute toxicity to algae/aquatic plants
EC50, Pseudokirchneriella subcapitata (green algae), Static, 72 Hour, Growth rate, > 0.0022 mg/l

Toxicity to bacteria
EC50, activated sludge, Static, 3 Hour, Respiration rates., > 100 mg/l

Octamethyl Cyclotetrasiloxane

Acute toxicity to fish
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested). No toxicity at the limit of solubility
LC50, Cyprinodon variegatus (sheepshead minnow), flow-through, 96 Hour, > 0.0063 mg/l No toxicity at the limit of solubility
LC50, Oncorhynchus mykiss (rainbow trout), flow-through, 96 Hour, > 0.022 mg/l

Acute toxicity to aquatic invertebrates
No toxicity at the limit of solubility
EC50, Daphnia magna (Water flea), flow-through test, 48 Hour, > 0.015 mg/l No toxicity at the limit of solubility
EC50, Mysidopsis bahia (opossum shrimp), flow-through test, 48 Hour, > 0.0091 mg/l

Acute toxicity to algae/aquatic plants
EC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Biomass, > 2,000 mg/l
EC50, blue-green alga Anabaena flos-aquae, static test, 96 Hour, Biomass, > 2,000 mg/l

Dodecamethylpentasiloxane

Acute toxicity to fish
No toxicity at the limit of solubility
LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 0.000075 mg/l, OECD Test Guideline 203

Persistence and degradability

Octamethyltrisiloxane

Biodegradability: Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 310 or Equivalent

Photodegradation Atmospheric half-life: 8.94 d **Method:**
Estimated.

Decamethyltetrasiloxane

Biodegradability: Material is not readily biodegradable according to OECD/EEC guidelines. 10-day Window: Not applicable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 310

Octamethyl Cyclotetrasiloxane

Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Biodegradation: 3.7 %
Exposure time: 29 d
Method: OECD Test Guideline 310

Photodegradation
Atmospheric half-life: 16 d
Method: Estimated.

Dodecamethylpentasiloxane

Biodegradability: Material is not readily biodegradable according to OECD/EEC guidelines. 10-day Window: Fail
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 310

Bioaccumulative potential

Octamethyltrisiloxane

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).
Partition coefficient: n-octanol/water(log Pow): 5.35 Estimated.

Decamethyltetrasiloxane

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).
Partition coefficient: n-octanol/water(log Pow): 8.21 Measured
Bioconcentration factor (BCF): 3,397 Estimated.

Octamethyl Cyclotetrasiloxane

Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).
Partition coefficient: n-octanol/water(log Pow): 6.49 Measured
Bioconcentration factor (BCF): 12,400 Pimephales promelas (fathead minnow) Measured

Dodecamethylpentasiloxane

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): 9.26
Bioconcentration factor (BCF): 170

Mobility in soil

Octamethyltrisiloxane

Potential for mobility in soil is slight (Koc between 2000 and 5000).
Partition coefficient (Koc): 3179 Estimated.

Decamethyltetrasiloxane

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient (Koc): > 5000 Estimated.

Octamethyl Cyclotetrasiloxane

Expected to be relatively immobile in soil (Koc > 5000).

Dodecamethylpentasiloxane

Expected to be relatively immobile in soil (Koc > 5000).
Partition coefficient (Koc): > 5000

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR
UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Flammable liquids, n.o.s.(POLYDIMETHYLSILOXANE)
UN number	UN 1993
Class	3
Packing group	III

Classification for SEA transport (IMO-IMDG):

Proper shipping name	FLAMMABLE LIQUID, N.O.S.(POLYDIMETHYLSILOXANE)
UN number	UN 1993
Class	3
Packing group	III
Marine pollutant	No
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Flammable liquid, n.o.s.(POLYDIMETHYLSILOXANE)
UN number	UN 1993
Class	3
Packing group	III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

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

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Pennsylvania Worker and Community Right-To-Know Act:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

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.

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Fire	Reactivity
1	2	0

Revision
Identification Number: 101199560 / A001 / Issue Date: 09/25/2017 / Version: 7.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

IHG	Industrial Hygiene Guideline
TWA	Time weighted average
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

Information Source and References

This SDS was prepared from information supplied by internal references within our company and external data sources.

Relatherm Heat Transfer Fluid urges each customer or recipient of this MSDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this MSDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product.