



SAFETY DATA SHEET

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| SECTION 1 | IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING |
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1.1. PRODUCT IDENTIFIER

Product Name: ALPHA-4 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: DSI VENTURES, INC.
1320 E. Commerce St.
Tyler, TX 75702
USA

Product Technical Information: (903) 526-7577
E-Mail: sales@dsiventures.com
Website: <http://dsiventues.com>

1.4. EMERGENCY TELEPHONE NUMBER

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

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| SECTION 2 | HAZARDS IDENTIFICATION |
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2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

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

Aspiration toxicant: Category 1.
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.
H413: May cause long lasting harmful effects to aquatic life.

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: Dec-1-ene, homopolymer, hydrogenated Dec-1-ene; oligomers, hydrogenated.

2.3. OTHER HAZARDS

Physical / Chemical Hazards:

No significant hazards.

Health Hazards:

High-pressure injection under skin may cause serious damage. Airborne low-viscosity branched alkanes 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 |
|--|-------------|-----------|-----------------------|-------------------|------------------------|
| Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated | 68037-01-4 | | 01-2119486452-34 | 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-xxxx | 0-2% | Aquatic Chronic 4 H413 |

| Name | CAS# | EC# | Registration# | Concentration* | DSD Symbols/Risk Phrases |
|--|-------------|-----------|-----------------------|----------------|--------------------------|
| 3,5-di-tert butyl-4hydroxyhydrocinnamic acid, C7-9-branched alkyl esters | 125643-61-0 | 406-040-9 | 01-0000015551-76-xxxx | 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.

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| SECTION 5 | FIRE FIGHTING MEASURES |
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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]: 204°C (400°F) [ASTM D-93]

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

Autoignition Temperature: No data available



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| SECTION 6 | ACCIDENTAL RELEASE MEASURES |
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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.

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| SECTION 7 | HANDLING AND STORAGE |
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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 |
|--|------------------------------|----------------|---------------------|------|
| Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated | Aerosols (thoracic fraction) | TWA | 5 mg/m ³ | |
| 3,5-di-tert butyl-4hydroxyhydrocinnamic acid, C7-9-branched alkyl esters | No data available | | | |

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: No protection is ordinarily required under normal conditions of use.

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



Skin and Body Protection: No skin protection is ordinarily required under normal conditions of use. 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: Colorless

Odor: Odorless

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: > 316 °C (600°F)

Flash Point [Method]: 204°C (400°F) [ASTM D-93]

Evaporation Rate (n-butyl acetate = 1): No data available

Flammability (Solid, Gas): Not applicable

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

Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C

Vapor Density (Air = 1): No data available

Relative Density (at 15 °C): 0.82

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: 18 cSt (18 mm²/sec) at 40°C | 4 cSt (4 mm²/sec) at 100°C

Explosive Properties: None

Oxidizing Properties: None

9.2. OTHER INFORMATION

Pour Point: -68°C (-90°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 > 1 mg/l (Aerosol) | Minimally toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403 |
| Irritation (Rat): No end point data. | Negligible hazard at ambient/normal handling temperatures. |
| Ingestion | |
| Acute Toxicity (Rat): 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 401 420 423 |
| Skin | |
| 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 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. | Not expected to cause cancer. |
| 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 |



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|--|--|
| 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: Data available. Test scores or other study results do not meet criteria for classification. | Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 407 408 |

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.

Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitising in test animals and humans.

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

Material -- Not expected to be harmful to aquatic organisms.

Material -- Not expected to demonstrate chronic toxicity to aquatic organisms

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 | 48 hour(s) | Daphnia magna | EL50 > 1000 mg/l: not toxic at water solubility |
| Aquatic - Acute Toxicity | 72 hour(s) | Alga | NOELR 1000 mg/l: not toxic at water solubility |
| Aquatic - Acute Toxicity | 72 hour(s) | Alga | EL50 > 1000 mg/l: not toxic at water solubility |
| Aquatic - Acute Toxicity | 96 hour(s) | Oncorhynchus mykiss | LL50 > 1000 mg/l: not toxic at water solubility |
| Aquatic - Chronic Toxicity | 21 day(s) | Daphnia magna | NOELR 125 mg/l: not toxic at water solubility |

Persistence, Degradability and Bioaccumulation Potential

| Media | Test Type | Duration | Test Results: Basis |
|-------|------------------------|-----------|-----------------------|
| Water | Ready Biodegradability | 28 day(s) | Percent Degraded 47.7 |

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

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.

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 DSI Ventures, Inc. in order to help the users of Alpha-4 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
Completed by David Sundin, Ph.D
Revised by David Childs