

SAFETY DATA SHEET

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product Form : Synthetic oil mixture containing nanodiamond and other proprietary additives
Product Name : D-Tribo®

CAS No. : 7782-40-3
Chemical Formula : C

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

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company: Adámas Nanotechnologies
8100 - 120 Brownleigh Drive
Raleigh, NC 27617 – 7300
Tel: 919-618-4515

1.4 Emergency contact

Tel: 919-618-4515

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

None

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Name	Product Identifier	Composition by wt.	GHS-US Classification
Diamond	CAS No.: 7782-40-3	<= 1%	Not a hazardous substance or mixture
Polyalphaolefin (PAO) Synthetic base oil	N/A	<=80%	Not a hazardous substance or mixture
Proprietary Dispersants	N/A	<=10%	Not a hazardous substance or mixture

molybdenum di(2-ethylhexyl) phosphorodithioate	CAS No.: 72030-25-2	<=7.5%	Not a hazardous substance or mixture
Phosphorodithioic acid, O, O-di-C1-14-alkyl esters, zinc salts	CAS No.: 68649-42-3	<=10% (wt.)	Skin corrosion/Irritation – Category 2B (CLP) Eye damage/irritation – Category 2 (CLP) Chronic Aquatic Toxicity – Category 2 (CLP) R36/38: Irritating to eyes and skin (DSD) R53: May cause long-term adverse effects in the aquatic environment
petroleum process oil, <3.0% DMSO extractable material	REACH #: 01-2119467170-45-XXXX EC No.: 265-155-0 CAS No.:64742-52-5	<=2.5%	Not a hazardous substance or mixture

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

In case of eye contact

Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.

If inhaled

Remove to fresh air, Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

In case of skin contact

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

If swallowed

Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

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

5.2 Special hazards arising from the substance or mixture

Carbon oxides, smoke, fume, incomplete combustion products, sulfur oxides, phosphorous oxides, metal oxide/oxides

5.3 Advice for firefighters

Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters 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.

5.4 Further information

Use water spray to cool unopened containers.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with spilled material. Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. For personal protection see section 8.

6.2 Environmental precautions

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

6.3 Methods and materials for containment and cleaning up

Land Spill:

Stop leak if you can do it 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 it 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 Reference to other sections

For disposal see section 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

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 ground procedures. However, bonding and grounds 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.

For precautions see section 2.2.

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 un-labelled containers.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
molybdenum di(2-ethylhexyl)phosphorodithioate	67-63-3	TWA	0.5 mg/m ³ 8 hours	USA. ACGIH Threshold Limit Values (TLV)
petroleum process oil, <3.0% DMSO	64742-52-5	TWA	5 mg/m ³ 8 hours	USA. ACGIH Threshold Limit Values (TLV)

extractable material				
		STEL	10 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
Phosphorodithioic acid, O, O-di-C1-14-alkyl esters, zinc salts	68649-42-3	TWA	0.5 mg/m ³ 8 hours	USA. ACGIH Threshold Limit Values (TLV)

8.2 Exposure controls

Appropriate engineering controls

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider: No special requirements under ordinary conditions of use and with adequate ventilation.

Personal protective equipment

Eye/face protection

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

Skin protection

Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include: No protection is ordinarily required under normal conditions of use.

Body Protection

Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include: 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.

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: No protection is ordinarily required under normal conditions of use and with adequate ventilation.

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.

Control of environmental exposure

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

9.1 Information on basic physical and chemical properties

- | | | |
|--------------------|---|-----------------------------------|
| a) Appearance Form | : | Blue/Green oily liquid suspension |
| b) Odour | : | No data available |
| c) Odour Threshold | : | No data available |
| d) pH | : | No data available |

e) Melting point/freezing point	:	No data available
f) Initial boiling point and boiling range	:	No data available
g) Flash point	:	226 °C (439 °F) – ASTM D-93
h) Evaporation rate	:	No data available
i) Flammability (solid, gas)	:	No data available
j) Upper/lower flammability or explosive limits	:	Upper Explosion Limit: No data available Lower Explosion Limit: No data available
k) Vapour pressure	:	<0.013 kPa (0.1 mm Hg) at 20°C
l) Vapour density	:	No data available
m) Relative density	:	3.5 g/cm ³ (Diamond) 0.826 g/cm ³ (PAO) at 15°C
n) Water solubility	:	Immiscible
o) Partition coefficient	:	noctanol/water: log Pow: >3.5
p) Auto-ignition temperature	:	No data available
q) Decomposition temperature	:	No data available
r) Viscosity	:	30.6 cSt (30.6 mm ² /sec) at 40°C 5.83 cSt (5.83 mm ² /sec) at 100°C
s) Explosive properties	:	No data available
t) Oxidizing properties	:	No data available

9.2 Other safety information

Pour point	:	-57°C (-71°F)
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SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No hazardous polymerization will occur

10.4 Conditions to avoid

Excessive heat, High energy sources of ignition

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - >2000 mg/kg
LC50 Inhalation – Rat – LC50 >5000mg/m³
LD50 Dermal - Rabbit - >2000 mg/kg
No data available

Skin corrosion/irritation

Skin - Rabbit
Result: Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.

Serious eye damage/eye irritation

Eyes - Rabbit
Result: May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

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 sensitizing in test animals and humans.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

None

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

Not expected to be harmful to aquatic organisms

No data available

12.2 Persistence and degradability

Expected to be inherently biodegradable

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

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.

Contaminated packaging

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 PRESSURISE, 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

DOT (US)

Not regulated for land transport

TDG

Not regulated for land transport

IMDG

Not regulated for sea transport according to IMDG-Code

IATA

Not regulated for air transport

SECTION 15. REGULATORY INFORMATION**SARA 302 Components**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

SARA 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.

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

Diamond
CAS-No.: 7782-40-3
Revision Date 2007-03-01

Pennsylvania Right To Know Components

Diamond
CAS-No.: 7782-40-3
Revision Date 2007-03-01

New Jersey Right To Know Components

Diamond
CAS-No.: 7782-40-3
Revision Date 2007-03-01

California Prop. 65 Components

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

SECTION 16. OTHER INFORMATION**Full text of H-Statements referred to under sections 2 and 3.**

None

HMIS Rating

Health hazard: 1
Chronic Health Hazard:*
Flammability: 1
Physical Hazard 0

NFPA Rating

Health hazard: 1
Fire Hazard: 1
Reactivity Hazard: 0

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