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PRF-23699

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MATERIAL SAFETY DATA SHEET

Part I: What is the material and what do I need to know in an emergency?

SECTION I - CHEMICAL PRODUCT & COMPANY INFORMATION

PRODUCT NAME (label identity): MIL-PRF-23699
also known as: Lubricating Oil, Aircraft Turbine Engines, Synthetic Base
NASA Code Numbers: O-156, O-154 and O-152

MSDS Preparer:
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PREPARATION DATE: 2007 August 9

PRODUCT DESCRIPTION: Lubricating Oil

PREPARED BY: Environment, Health & Safety

SECTION 2 - HAZARDS IDENTIFICATION

This material is classified as hazardous under OSHA regulations.

EMERGENCY OVERVIEW: This material may cause irritation of skin and eyes. Vapors from heated product may cause respiratory irritation. May be harmful if swallowed. Based on reports of tricresyl phosphate this product may cause delayed neurotoxicity.

APPEARANCE: Amber to brown liquid. Mild odor.

ROUTES OF EXPOSURE: Eye and skin contact. Vapor inhalation and oral (due to accidental ingestion).

ACUTE EFFECTS:

Inhalation: Respiratory irritant, particularly if vapors are from heated or burning liquid. May cause delayed neurotoxic reaction.

Ingestion: May be harmful if swallowed. May cause gastric irritation and diarrhea.

Skin: Slightly irritating to the skin.

Eyes: May be irritating to the eyes.

SENSITIZATION HAZARD: Some aromatic amines have been found to be skin sensitizers in animal studies.

CHRONIC EFFECTS: Prolonged or repeated exposures may cause absorption of tricresyl phosphate through the skin. Tricresyl phosphate has been reported to cause delayed neurotoxicity.

TARGET ORGANS: Central nervous system.

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Section 2 – Hazards Identification (continued)

SIGNS AND SYMPTOMS OF EXPOSURE: Exposure may cause irritation, characterized by tears, redness and burning sensation (eyes), redness, swelling or cracking of the skin, or burning sensation in nose, throat and lungs (Inhalation). Neurotoxicity may be characterized by dizziness, headache, confusion and "intoxication."

CARCINOGENIC CLASSIFICATION:

None of the ingredients in this product are considered known or anticipated cancer causing agents in humans by IARC, NTP, OSHA, or ACGIH.

MEDICAL CONDITIONS AGGRAVATED: Pre-existing eye, skin, respiratory and neurological disorders may be aggravated by exposure to this product.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	C.A.S. NUMBER	PERCENT (Weight)
Tricresyl phosphate*	1330-78-5	< 5 %
Aromatic amine blend	N/A	< 5 %
Additives	N/A	< 1 %
Synthetic hydrocarbons/esters	N/A	> 60 %

* All isomers. Less than 1% of total Tricresyl phosphate isomers (< 0.05% of product) is the ortho form (78-30-8).

EXPOSURE LIMITS, see Section 8.

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Part II What should I do if a hazardous situation occurs?

SECTION 4 - FIRST AID MEASURES

EMERGENCY FIRST AID:

EYES: Immediately and continuously flush eyes with a large amount of water for at least 15 minutes, occasionally lifting the upper and lower lids. Then seek medical aid.

SKIN: Remove contaminated clothing. Wash areas of skin contact with water and non-abrasive soap. If skin irritation persists, seek medical attention. Wash contaminated clothing before reuse. Leather items cannot be decontaminated and should be destroyed to prevent reuse. If product is injected under the skin (high pressure) get immediate medical attention. Early intervention can minimize the extent of injury.

INHALATION: Immediately move subject to fresh air. Get immediate medical aid. If breathing is difficult, give oxygen. If not breathing, give rescue breathing.

INGESTION: Get medical aid immediately. If medical aid is delayed, contact poison control center to advise on inducing vomiting. Never give anything by mouth to an unconscious or groggy person. If vomiting occurs spontaneously, keep airway clear.

SECTION 5 - FIRE FIGHTING MEASURES

FLASHPOINT: > 400 °F (> 204 °C)
LEL and UEL: Not established

NFPA DESIGNATIONS:
Flammability - 1 (slight)
Health - 1 (slight)
Reactivity - 0 (none)

AUTOIGNITION TEMP: > 700 °F (> 371 °C)

EXTINGUISHING MEDIA: Small fires use dry chemical. For larger fires use water spray or fog. Cool containers exposed to fire to prevent pressure buildup and ignition.

FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus (SCBA) and protective clothing to prevent contact with skin, eyes, and respiratory system. All non-essential personnel should evacuate the area.

FIRE & EXPLOSION HAZARDS: Slightly flammable in presence of open flames and heat sources.

EXPLOSIVE SENSITIVITY TO IMPACT: Not shock sensitive.

EXPLOSIVE SENSITIVITY TO STATIC DISCHARGE: Not sensitive to static discharge.

HAZARDOUS COMBUSTION PRODUCTS: Carbon oxides, oxides of nitrogen, sulfur and phosphorus.

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SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL OR LEAK PROCEDURES: Eliminate ignition sources (flames, flares, electrical sparks). Wear appropriate personal protective equipment. Stop leak/spill at source if possible to do so without risk of injury. Prevent entry into sewers and waterways. For smaller spills, absorb spill in oil dry, dry sand, or similar non-combustible material and transfer to a suitable container for disposal. For larger spills, dike area of spill to prevent spreading and transfer liquid to waste tank. Remaining liquid should be taken up on absorbent material and transferred to a suitable container for disposal.

(see section 13 - Disposal Methods)

Part III How can I prevent hazardous situations from occurring

SECTION 7 - HANDLING AND STORAGE

HANDLING: Handling should occur in open air or well ventilated areas, free of ignition sources. Workers should wear proper personal protective equipment. Eye washes and emergency showers should be located nearby.

STORAGE: Store in suitable container. Dike storage area to contain 110% of total container volume.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:

Tricresyl phosphate (ortho isomer - CAS 78-30-8)

OSHA PEL: 0.1 mg/m³ (TWA)

CAL-OSHA PEL: 0.1 mg/m³ (TWA); WISHA PEL: 0.1 mg/m³ (TWA)

ACGIH TLV: 0.1 mg/m³ (TWA) (skin); NIOSH REL: 0.1 mg/m³ (TWA) (skin)

NIOSH IDLH: 40 mg/m³

Oil mist mineral

OSHA PEL: 5.0 mg/m³ (TWA); CAL-OSHA PEL: 5.0 mg/m³ (TWA)

WISHA PEL: 5.0 mg/m³ (TWA); ACGIH TLV: 5.0 mg/m³ (TWA), 10 mg/m³ (STEL)

NIOSH REL: 5.0 mg/m³ (TWA), 10 mg/m³ (STEL); NIOSH IDLH: 2500 mg/m³

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Section 8 – Exposure Controls/Personal Protection (continued)

ENGINEERING CONTROLS: Facilities storing or utilizing this material should be equipped with an eye wash facility and a safety shower.

RESPIRATORY PROTECTION: Generally none required under normal conditions of ventilation. Emergency or planned entry into unknown concentrations or IDLH conditions require use of a self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive pressure mode.

VENTILATION: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain concentrations below published exposure limits.

PROTECTIVE GLOVES: Wear butyl rubber or Neoprene gloves to prevent contact with this material. Gloves must be discarded when they tear, puncture, when the recommended protection period has expired, or when permeation or penetration has taken place.

EYE PROTECTION: Wear splash-proof safety goggles or other approved eye protection.

OTHER PROTECTIVE CLOTHING AND EQUIPMENT: Select as dictated by use or process.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
BOILING POINT:	> 600 °F (> 315 °C)
FREEZING POINT:	Not Applicable
POUR POINT:	< - 60 °F (< - 51 °C)
VAPOR PRESSURE:	< 0.1mm.Hg @ 20 °C
SPECIFIC GRAVITY:	approx. 1.0
DENSITY	8.34 lb/gal
VAPOR DENSITY (air= 1):	> 5
EVAPORATION RATE (BuOAc = 1):	<< 1
PERCENT VOLATILES:	Not available
VOLATILE ORGANIC COMPOUNDS (VOC):	Not available
SOLUBILITY:	< 1 % in water
OIL/WATER PARTITION:	Unknown
pH OF SOLUTION:	N/A
APPEARANCE AND ODOR:	Amber to brown liquid, with mild odor.
ODOR THRESHOLD:	N/A

SECTION 10 - STABILITY AND REACTIVITY

STABILITY: Stable.

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Avoid storing near incompatible materials.

INCOMPATIBILITY: Incompatible with oxidizers and organic peroxides.

HAZARDOUS BYPRODUCTS: Oxides of carbon, nitrogen, sulfur and phosphorus.

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Part IV *Is there any other useful information about this material?*

SECTION 11 - TOXICOLOGICAL INFORMATION

	Oral LD ₅₀ (rat)	Dermal LD ₅₀ (cat)	Inhal LC ₅₀ (rat)	Skin Irritation	Eye Irritation
Tricresyl phosphate 1330-78-5	5,200 mg/kg	1,500 mg/kg	N. Av.	Mild, 500 mg/24h Open Draise (rbt)	Mild, 500 mg/24h Std Draise (rbt)

SECTION 12 - ECOLOGICAL INFORMATION

This section not in use at this time

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: Dependent on the state of the material at the end of use - consult environmental site engineers for proper disposal method.

SECTION 14 - TRANSPORT INFORMATION

U.S. DOT: Not regulated

IATA: Not regulated

SECTION 15 - REGULATORY INFORMATION

Global Inventories: All known ingredients are listed in the following national inventories:
 AICS (Australia) DSL/NDSL (Canada) ECL (Korea)
 EINECS (EU) ENCS (Japan) TSCA (USA)
 CHINA NEW ZEALAND PICCS (Phillippines)

Product Classifications:

EPCRA: **SARA 312 HAZARD CLASSES:**
 Immediate Health Hazard Yes Delayed Health Hazard: No
 Reactive Hazard No Fire/Flammability No
 Sudden Pressure Release No

CANADA: **WTMIS:** Hazard Class D2B -- Other toxic effects.

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Section 15 - Regulatory Information (continued)

Regulated Ingredients:

The ortho isomer of tricresyl phosphate is a marine pollutant or severe marine pollutant under Dept of Transportation regulations. This isomer is below the regulatory threshold in this product.

SECTION 16 - OTHER INFORMATION

This material has not been tested on a whole.

This product should not be sold or supplied to a person or company outside of The Boeing Company without first relabeling to indicate the supplier to Boeing and providing the supplier MSDS in compliance with applicable federal, state, or provincial hazard communication regulations.

This MSDS was prepared for laboratory test samples at The Boeing Company.
Products that this MSDS can be applied to are listed on the Qualified Products List of Products Qualified Under Performance Specification MIL-PRF-23699, Lubricating Oil, Aircraft Turbine Engines, Synthetic Base, NATO Code Numbers O-156, O-154 and O-152 or qualified to AS5780, Specification for Aero and Aero-Derived Gas Turbine Engine Lubricants.

Revision History: New MSDS. 8/9/2007

The information contained herein is based on the data available to Boeing and is believed to be current as of the date of this Material Safety Data Sheet. Boeing makes no warranty, expressed or implied, regarding the accuracy of the data. The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material. Boeing assumes no responsibility for injury from the use of the product described in this Material Safety Data Sheet.

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