

MATERIAL SAFETY DATA SHEET

SECTION 1	PRODUCT AND COMPANY IDENTIFICATION
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PRODUCT

Product Name: MOBILITH AW-2
Product Description: Base Oil and Additives
Product Code: 643536-00, 970629
Intended Use: Grease

COMPANY IDENTIFICATION

Supplier: EXXON MOBIL CORPORATION
 3225 GALLOWS RD.
 FAIRFAX, VA. 22037 USA

24 Hour Health Emergency 609-737-4411
Transportation Emergency Phone 800-424-9300
ExxonMobil Transportation No. 281-834-3296
MSDS Requests 713-613-3661
Product Technical Information 800-662-4525, 800-947-9147
MSDS Internet Address <http://www.exxon.com>, <http://www.mobil.com>

SECTION 2	COMPOSITION / INFORMATION ON INGREDIENTS
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Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
ZINC DIALKYL DITHIOPHOSPHATE	68457-79-4	< 2.5%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

SECTION 3	HAZARDS IDENTIFICATION
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This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 0	Flammability: 1	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4	FIRST AID MEASURES
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INHALATION

Under normal conditions of intended use, this material is not expected to be an inhalation hazard.

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

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

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

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: 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.

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

FLAMMABILITY PROPERTIES

Flash Point [Method]: >200C (392F) [EST. FOR OIL, ASTM D-92 (COC)]

Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D

Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

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SPILL MANAGEMENT

Land Spill: Scrape up spilled material with shovels into a suitable container for recycle or disposal.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Skim from surface.

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.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

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 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:

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

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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: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; 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.

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

Skin and 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.

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

See Sections 6, 7, 12, 13.

SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Solid

Form: Semi-fluid

Color: Green

Odor: Characteristic

Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.901

Flash Point [Method]: >200C (392F) [EST. FOR OIL, ASTM D-92 (COC)]

Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D

Autoignition Temperature: N/D

Boiling Point / Range: > 316C (600F)

Vapor Density (Air = 1): N/D

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

Evaporation Rate (n-butyl acetate = 1): N/D

pH: N/A

Log Pow (n-Octanol/Water Partition Coefficient): > 3.5

Solubility in Water: Negligible

Viscosity: 115 cSt (115 mm²/sec) at 40 C

Oxidizing Properties: See Sections 3, 15, 16.

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OTHER INFORMATION

Freezing Point: N/D

Melting Point: >246°C (475°F)

DMSO Extract (mineral oil only), IP-346: < 3 %wt

NOTE: Most physical properties above are for the oil component in the material.

SECTION 10	STABILITY AND REACTIVITY
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STABILITY: Material is stable under normal conditions.

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

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
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ACUTE TOXICITY

<u>Route of Exposure</u>	<u>Conclusion / Remarks</u>
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Not determined.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC
2 = NTP SUS

3 = IARC 1
4 = IARC 2A

5 = IARC 2B
6 = OSHA CARC

SECTION 12	ECOLOGICAL INFORMATION
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The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

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

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13	DISPOSAL CONSIDERATIONS
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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.

DISPOSAL RECOMMENDATIONS

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.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning PRECAUTIONARY LABEL TEXT: Empty containers may retain residue and can be dangerous. 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. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with

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governmental regulations.

SECTION 14	TRANSPORT INFORMATION
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LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

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

AIR (IATA) : Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
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OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: EINECS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
ZINC DIALKYL DITHIOPHOSPHATE	68457-79-4	< 2.5%

The Following Ingredients are Cited on the Lists Below:*

Chemical Name	CAS Number	List Citations
DIPHENYLAMINE	122-39-4	5, 9, 18
ZINC DIALKYL DITHIOPHOSPHATE	68457-79-4	13, 15, 17

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

- Section 13: Disposal Considerations - Disposal Recommendations was modified.
- Section 09: Boiling Point C(F) was modified.
- Section 09: Vapor Pressure was modified.
- Section 03: Health Hazards was modified.
- Section 11: Inhalation Lethality Test Data was modified.
- Section 06: Accidental Release - Spill Management - Land was modified.
- Section 06: Accidental Release - Spill Management - Water was modified.
- Section 09: Relative Density - Header was modified.
- Section 09: Flash Point C(F) was modified.
- Section 09: Viscosity was modified.
- Section 02: Component table was modified.
- Section 11: Skin Irritation Conclusion was modified.
- Section 11: Inhalation Lethality Test Comment was modified.
- Section 15: SARA (313) TOXIC RELEASE INVENTORY - Table was modified.
- Section 08: Exposure Limit Values - Header was added.
- Section 12: Ecological Information - Acute Aquatic Toxicity was added.
- Section 12: Ecological Information - Acute Aquatic Toxicity was added.
- Section 16: Global Disclaimer was added.
- Section 03: Environmental Hazard was deleted.
- Section 03: Environmental Hazard - Header was deleted.
- Section 16: Disclaimer was deleted.
- Section 12: Ecological Information - Acute Aquatic Toxicity was deleted.
- Section 12: Ecological Information - Acute Aquatic Toxicity was deleted.

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Internal Use Only

MHC: 0, 0, 0, 0, 0, 0

PPEC: A

DGN: 2009988XUS (550424)

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BARRIER FLUID FDA®

Buffer / Barrier Fluid for Mechanical Seals



Beyond Synthetic™

Beyond Synthetic™

Barrier Fluid FDA® is a pure, non-reactive, synthetic fluid that provides superior lubrication and cooling for double and tandem mechanical seals.

Barrier Fluid FDA® provides very stable seal performance over an extremely wide temperature range, satisfying most seal service requirements. Barrier Fluid FDA® is extremely clean and has excellent low temperature fluidity and heat transfer properties.

Barrier Fluid FDA® is sanctioned under the FDA CFR Title 21 Sections 178.3620(a)(b); 172.878; 175.105; 172.200 and 210; 177.2260, 2600 and 2800; 178.3570 and 3910. Barrier Fluid FDA® is NSF certified for H1 service. Barrier Fluid FDA® is essentially inert, allowing it to be used with most hydrocarbon gases and aqueous acids and bases. Barrier Fluid FDA® is an undyed product.

Performance Advantages:

• Environmentally Safe

Royal Purple® Barrier Fluids are not listed on the EPA's VHAP (volatile hazardous air pollutants) or VOC (volatile organic compounds) lists.

• Sanctioned by the EPA, NSF

Barrier Fluid FDA® is the first synthetic white oil sanctioned under the FDA's CFR Title 21 Sections 178.3620(a) & (b); 172.878; 175.105; 176.200. It is also sanctioned under 210; 177.2260 and 2800; and 178.3570 and 3910. Barrier Fluid FDA® is NSF certified for H1 service.

• Minimal Disposal Problems

Royal Purple® Barrier Fluids can be recycled, burned or disposed the same as mineral oil.

• Very Low Moisture Content

Royal Purple® Barrier fluids have a low moisture content to prevent seal problems or catalyst poisoning where applicable.

• Highest Purity

Barrier Fluid FDA® contains no impurities such as sulfur, vanadium, amines, etc., that can be harmful or reactive to process fluids or poison the catalyst if it enters a process stream.

• Extremely Clean

Barrier Fluid FDA® has a typical ISO Cleanliness Grade 14/13/11, minimizing abrasive wear to seal faces and extending seal life.

• Excellent Heat Transfer Properties

Royal Purple® Barrier Fluids are 25 to 30 percent better than mineral oil to keep seals cool.

• Excellent Low Temperature Fluidity

Royal Purple® Barrier Fluids have excellent low temperature fluidity for cryogenic and cold weather service.

• Uniform Molecular Size

The no light ends, plus excellent thermal stability of Royal Purple® Barrier Fluids provide maximum protection against blistering of carbon seal faces caused by fluid volatility.

• High Flash Point

Royal Purple® Barrier Fluids have a high flash point for maximum safety.

• Compatible with Most Fluids

Royal Purple® Barrier Fluids can be mixed with mineral oils, PAOs and diester fluids but should not be mixed with glycol or silicone synthetics.

• Wide Seal Compatibility Range

Royal Purple® Barrier Fluids are compatible with Viton®, neoprene, Buna N (except high ACN), silicone, polyurethane ester, epichlorohydrin, polysulfide, ethylene / acrylic, polycrylate, fluorosilicone, propylene oxide, chlorosulfonated polyethylene, chlorinated polyethylene, Kalrez®, Nordel®, fluoroelastomer, nitrile and others. It is not for use with EPDM or EPR elastomers. Viton®, Kalrez® and Nordel® are registered trademarks of E.I. DuPont.

Typical Properties *	Barrier Fluid Grade				
	22 ^{**}	34 ^{**}	56 ^{**}	78 ^{**}	910
Vapor Pressure mmHG @ 100°F	0.0060	0.0001	0.0005	0.0003	0.0001
Pour Point °F	-70	-85	-75	-65	-65
Flash Point °F	335	445	462	482	505
Fire Point °F	350	485	510	542	555
Boiling Point °F	538	655	718	759	755
Autoignition °F	>420	>600	>600	>600	>600
Specific Gravity	0.799	0.816	0.824	0.833	0.838

* Properties are typical and may vary

** Barrier Fluid 22 is 80 percent biodegradable within 28 days per industry standard CEC L33-A-94.

*** NSF certified for H1 service.