



## Mobilgrease 33

ExxonMobil Aviation, United States

Synthetic Aviation Grease

## Product Description

Mobilgrease 33 is a high-performance lithium-complex grease designed for general-purpose aircraft use. Its consistency is between the NLGI grades 1 and 2. Mobilgrease 33 utilizes a 100% polyalphaolefin base oil and premium additives which ensure outstanding lubrication performance over a wide temperature range and operating conditions.

## Features and Benefits

The lithium complex thickener system provides excellent structural stability and resistance to water wash-out. Polyalphaolefin base oil is used in Mobilgrease 33 because of its exceptional thermal/oxidative resistance potential, low volatility, and superb low-temperature capability, without the potential vulnerability of an ester base oil to degradation from reaction with water. The synthetic polyalphaolefin base oil offers excellent low-temperature mobility/pumpability and very low starting and running torque values. In addition, the state-of-the-art additive system in Mobilgrease 33 provides superior rust and wear protection and load-carrying capacity compared to aviation greases that meet the minimum requirements of the MIL-PRF-23827 specification.

Mobilgrease 33, with its unique features, provides the following advantages and potential benefits:

Features	Advantages and Potential Benefits
High viscosity index polyalphaolefin basestock	Very wide operating temperature range - outstanding high and low temperature performance. Excellent lubricant film protection at high temperatures
Good storage stability	Grease structure integrity maintained - low oil separation
Exceptional resistance to thermal and oxidative degradation	Long grease and lubricated part service life

<b>Features</b>	<b>Advantages and Potential Benefits</b>
Resistance to degradation by water (hydrolysis)	No risk of corrosion induced by acidic base oil degradation products
Low volatility	Little vulnerability to significant base oil loss by evaporation in service
Excellent protection against wear, corrosion, and rusting	Excellent bearing and component protection
Extreme-pressure characteristics	Prevention of excessive wear, even under shock load
High resistance to water washout	Excellent grease performance in adverse weather and other water-exposure conditions

## Applications

Mobilgrease 33 is a true multipurpose aviation grease intended for use in highly loaded anti-friction bearings, gears, and actuators as well as instruments, high speed bearings (though not recommended for wheel bearings), and general airframe lubrication, over operating temperatures from  $-100^{\circ}\text{F}$  to  $250^{\circ}\text{F}$  ( $-73^{\circ}\text{C}$  to  $121^{\circ}\text{C}$ ). It can be used in all applications for which the aircraft manufacturer specifies U.S. Military Specification MIL-PRF-23827, Type I (Grease, Aircraft and Instrument, Gear and Actuator Screw, Grease thickened with metallic soap), Boeing BMS 3-33B (Grease, Aircraft, General Purpose), and Airbus AIMS09-06-002/SAE AMS3052 (Grease, General Purpose, Airframe, Low Temperature Range, Lithium Thickened). Mobilgrease 33 is listed in the Qualified Products List of Airbus, Boeing, and the U.S. Military for these specifications. The NATO Code Number for Mobilgrease 33 is G-354.

## Specifications and Approvals

<b>Mobilgrease 33</b>	<b>Is Approved Against</b>	<b>Meets</b>

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Airbus AIMS09-06-002	X	
Boeing BMS 3-33B Type 1	X	
MIL-PRF-23827C, Amendment 2, Type I	X	
NATO G-354	X	
SAE AMS3052		X

## Typical Properties

	<b>Test Methods</b>	<b>MIL-PRF-23827 Type I Requirements</b>	<b>Mobilgrease 33 (1)</b>
NLGI Grade			1 1/2
Thickener Type		Metallic Soap	Lithium Complex
Color	Visual		Blue Green
Structure/Consistency	Visual	Smooth, free from lumps and visual impurities	Pass
Odor	Olfactory	No rancid, perfume, or alcohol odor	Pass
Viscosity of Base Oil, cSt	ASTM D 445		

	<b>Test Methods</b>	<b>MIL-PRF-23827 Type I Requirements</b>	<b>Mobilgrease 33 (1)</b>
at 40 °C			12.5
at 100 °C			3.2
Dropping Point, °C (°F)	ASTM D 2265	165 (329) min	255 (491)
Low Temp. Torque at -73°C (-100°F), Nm	DEF STAN 05-50 Part 62, ASTM D 1478		
Starting		1.00 max	0.52
Running, after 1 Hr		0.10 max	0.06
Low Temp. Torque with 10% water at -73°C (-100°F), Nm	DEF STAN 05-50 Part 62, ASTM D 1478		
Starting			0.67
Running, after 1 Hr			0.09
Penetration at 25°C (77°F), mm/10	DEF STAN 05-50 Part 63, ASTM D 217		
Unworked		200 min	285
60 Strokes Worked		270-310	292
100,000 Strokes Worked	FTM 313	270-375	330
Penetration, 100,000 Strokes Worked with 10% water, mm/10	DEF STAN 05-50 Part 63, ASTM D 217		330

	<b>Test Methods</b>	<b>MIL-PRF-23827 Type I Requirements</b>	<b>Mobilgrease 33 (1)</b>
Oil Separation, 30 Hrs at 100°C, wt %	ASTM D 6184	5 max	4
Evaporation Loss, 22 Hrs at 100°C, wt %	ASTM D 2595	2 max	1
Evaporation Loss, 500 Hrs at 121°C, wt %	ASTM D 2595		8.7
Copper Strip Corrosion, 24 Hrs at 100°C	ASTM D 4048	1b max	1b
AMS4640 Al/Ni Bronze Corrosion, 24 Hrs at 100°C	ASTM D 4048		Pass
Four Ball Wear, scar dia., 1200rpm/40kg/1hr/75°C, mm	ASTM D 2266		0.4
Load Wear Index, kgf	ASTM D 2596	30 min	110
Weld Load, kgf	ASTM D 2596		700
Timken OK Load, lbf	ASTM D 2509		55
Rust Protection, 48 Hrs at 125°F, >1mm dia Spots	ASTM D 1743	0 in 2 out of 3 bearings	0,0,0
SKF EMCOR Rust, 3% NaCl, rating	ASTM D 6138		0,0
Water Washout, 1 Hr at 38°C (100 °F), wt %	ASTM D 1264	20 max	3
Water Washout, 1 Hr at 79°C (174 °F), wt %	ASTM D 1264		6

	<b>Test Methods</b>	<b>MIL-PRF-23827 Type I Requirements</b>	<b>Mobilgrease 33 (1)</b>
High Temperature Performance, Hrs at 121°C	ASTM D 3336	1,000 min	2,200+
Oxidation Stability, pressure drop in kPa	ASTM D 942		
100 Hrs at 99°C		70 max	11
500 Hrs at 99°C		105 max	25
Fretting Wear, mg loss	ASTM D 4170		0.6
Dynamic Bearing Life, No of cycles	BMS 3-33-8.2		Pass
Navy Gear Wear Test, mg loss/1000 cycles	FTM 335		
2.3 kg load		2.5 max	1.1
4.5 kg load		3.5 max	1.6
Dirt Count, Particles/mL	FTM 3005		
25-74 Micron Size		1000 max	0
75 Micron or Larger			00
Storage Stability, 6 months at 40°C, Penetration, mm/10	FTM 3467		
Unworked	ASTM D 217	200 min	289

	<b>Test Methods</b>	<b>MIL-PRF-23827 Type I Requirements</b>	<b>Mobilgrease 33 (1)</b>
60x worked	ASTM D 217		288
60x worked, Difference from Unworked	ASTM D 217		-1
Difference from Original	ASTM D 217	±30	2
Elastomer Compatibility, 168 Hrs at 70°C, % vol change	FTM 3603		
Nitrile (NBR-L, AMS3217/2)			+12.6
Thermoplastic Compatibility, 70 Hrs at 100°C, % vol change	ASTM D 4289		
Hytrel 6356 + 0.5% carbon black			3.4
Delrin 100 AF (ASTM D 4181)			+0.1
PTFE (Teflon) (AMS 3652)			+0.1
Nylatron GS			-0.5
(1) Values may vary within modest ranges			

## Health and Safety

Based on available toxicological information, this product is not expected to produce adverse effects on health when used and handled properly. Information on use and handling, as well as health and safety information, can be found in the Material Safety Data Sheet (MSDS), which can be obtained from your local distributor or via the

Internet on <http://www.exxonmobil.com/lubes>.

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