



## Mobilgrease 28

ExxonMobil Aviation, United States

Synthetic Aviation Grease

### Product Description

Mobilgrease 28 is a supreme performance, wide-temperature, antiwear grease designed to combine the unique features of a polyalphaolefin (PAO) synthetic base fluid with an organo-clay (non-soap) thickener. Its consistency is between an NLGI No. 1 and No. 2 grease. It offers outstanding performance over a wide temperature range. The wax-free nature of the synthetic base fluid, together with its high viscosity index compared to mineral oils, provide excellent low temperature pumpability, very low starting and running torque, and can help reduce operating temperatures in the load zone of rolling element bearings.

The clay thickener gives Mobilgrease 28 a high dropping point value of around 300°C, which provides excellent stability at high temperatures. Mobilgrease 28 resists water washing, provides superior load-carrying ability, reduces frictional drag, and prevents excessive wear. Tests show that Mobilgrease 28 lubricates effectively rolling element bearings under conditions of high speeds and temperatures. Mobilgrease 28 has also shown excellent ability to lubricate heavily loaded sliding mechanisms, such as wing flap screw jacks.

For more than 30 years, Mobilgrease 28 has been the multi-purpose grease of choice for military and related aviation applications, worldwide.

### Features and Benefits

A particular requirement of aviation greases is the need to resist high temperature stresses, while providing excellent starting and low torque at low-temperature. To meet this combination of needs ExxonMobil product formulation scientists chose synthetic hydrocarbon base oils for Mobilgrease 28 because of their low volatility, exceptional thermal/oxidative resistance, and superb low-temperature capability. Formulators chose specific thickener chemistry and a proprietary additive combination which helps maximize the benefits of the synthetic base oils.

Mobilgrease 28 meets the requirements of key military and commercial aviation specifications and has built up a superb reputation for performance and reliability among users around the world.

Mobilgrease 28 provides the following advantages and potential benefits:

| Features   | Advantages and Potential Benefits  |
|--|--|
| High viscosity index (VI) synthetic base stock with no wax content | Allows wide operating temperature range - outstanding high and low temperature performance |

| <b>Features</b>                                 | <b>Advantages and Potential Benefits</b>  |
|---|---|
|   | Provides thicker fluid films protecting against wear of equipment parts operating at high temperature |
|   | Causes low resistance during start-up at very low temperatures  |
| Excellent protection against wear and corrosion | Superb bearing protection and helps extend bearing life and reduce bearing replacement costs          |
| Extreme-pressure protection characteristics     | Avoids excessive wear, even under shock load  |
| High thermal/oxidative stability                | Long relubrication intervals  |
| High resistance to water washout                | Maintains excellent grease performance in adverse weather and other water-exposure conditions         |

## Applications

Mobilgrease 28 is designed for the lubrication of plain and rolling bearings at low to high speeds, and splines, screws, worm gears, and other mechanisms where high friction reduction, low wear, and low lubricant friction losses are required. The recommended operating temperature range is -54°C to 177°C (-65°F to 350°F) with appropriate relubrication intervals.

Mobilgrease 28 is recommended for use in landing wheel assemblies, control systems and actuators, screw jacks, servo devices, sealed-bearing motors, oscillating bearings, and helicopter rotor bearings on military and civil aircraft. Subject to equipment manufacturer approvals, it can also be used on naval shipboard auxiliary machinery and where superseded specifications MIL-G-81322 (WP), MIL-G-7711A, MIL-G-3545B, and MIL-G-25760A are recommended.

Mobilgrease 28 is also recommended for industrial lubrication, including sealed or repackable ball and roller bearings wherever extreme temperature conditions, high speeds, or water washing resistance are factors. Typical industrial applications include conveyor bearings, small alternator bearings operating at temperatures near 177°C (350°F), high-speed miniature ball bearings, and bearing applications where oscillatory motion, and vibration create problems.

Mobilgrease 28 is qualified by the U.S. Military under Specification MIL-PRF-81322, General-Purpose, Aircraft, and Specification DOD-G-24508A (Navy) for shipboard auxiliary machinery. It is a U.S. Military Symbol WTR and NATO Code Number G-395 grease.

## Specifications and Approvals

| <b>Mobilgrease 28</b>     | <b>Is Approved Against</b> | <b>Quality Level</b> |
|---------------------------|----------------------------|----------------------|
| MIL-PRF-81322G            | X                          |                      |
| DOD-G-24508A, Amendment 4 |                            | X                    |

| <b>Mobilgrease 28</b> | <b>Is Approved Against</b> | <b>Quality Level</b> |
|-----------------------|----------------------------|----------------------|
| NATO G-395            | X                          |                      |

## Typical Properties

|  | <b>Test Methods</b>    | <b>Mobilgrease 28<br/>Typicals (1)</b> | <b>MIL-PRF-81322<br/>Limits</b> |
|--|------------------------|--|---------------------------------|
| NLGI Grade   |                        | 1 1/2                                  |                                 |
| Thickener Type   |                        | Clay (non-soap)                        |                                 |
| Color  | Visual                 | Dark Red                               |                                 |
| Structure  | Visual                 | Smooth, buttery                        |                                 |
| Dropping Point, °C (°F)  | ASTM D 2265            | 307 (584)                              | 232 (450) min                   |
| Viscosity of Base Oil, cSt   | ASTM D 445             |  |                                 |
| at 40°C  |                        | 30                                     |                                 |
| at 100°C   |                        | 5.7                                    |                                 |
| Low Temp. Torque at -54°C (-65°F), Nm (g-cm)   | ASTM D 1478            |  |                                 |
| Starting   |                        | 0.43(4400)                             | 0.98 (10,000) max               |
| Running, after 1 Hr  |                        | 0.05 (510)                             | 0.098 (1,000) max               |
| Penetration @ 25°C (77°F), 60 Stoke Worked, mm/10  | ASTM D 217             | 293                                    | 265-320                         |
| Extended Worked Penetration Stability, 100,000 Strokes, mm/10                                | FTM 313                | 303                                    | 350 max                         |
| Oil Separation, 30 Hrs at 177°C, wt %  | ASTM D 6184            | 3.5                                    | 2.0 - 8.0                       |
| Evaporation Loss, 22 Hrs at 177°C, wt %  | ASTM D 2595            | 6                                      | 10 max                          |
| Copper Strip Corrosion, 24 Hrs at 100°C  | ASTM D 4048            | 1b                                     | 1b max                          |
| Four-Ball Wear, Scar dia, mm   | ASTM D 2266            | 0.6                                    | 0.8 max                         |
| Load Wear Index, kgf   | ASTM D 2596            | 40                                     | 30 min                          |
| Rust Protection, 48 Hrs at 125°F, > 1mm dia Corrosion Spots                                  | ASTM D 1743            | Pass                                   | 0                               |
| Water Washout, 1 Hr at 41°C, wt %  | ASTM D 1264            | 1                                      | 20 max                          |
| High Temperature Performance, Hrs at 177°C   | ASTM D 3336 (modified) | Pass                                   | 400 min                         |
| Oxidation Stability, pressure drop in kPa  | ASTM D 942             |  |                                 |
| 100 Hrs at 99°C  |                        | Pass                                   | 83 max                          |
| 500 Hrs at 99°C  |                        | Pass                                   | 172 max                         |
| Dirt Count, Particles/mL   | FTM 3005               |  |                                 |
| 25-74 Micron   |                        | Pass                                   | 1000 max                        |
| 75 Micron or Larger  |                        | 0                                      | 0                               |
| Oscillation Friction and Wear, Scar Dia, 35,000 cycles, 90° Angle, Aluminum Bronze Block, mm | Modified ASTM D 3704   | Pass                                   | 6.35 max                        |

|   | <b>Test Methods</b> | <b>Mobilgrease 28<br/>Typicals (1)</b> | <b>MIL-PRF-81322<br/>Limits</b> |
|---|---------------------|--|---------------------------------|
| Rubber Swell, L Type Synthetic, 1 week at 70°C (158°F), vol %   | FTM 3603            | 6                                      | 10 max                          |
| (1) Typical properties are typical of those obtained with normal production tolerance and may vary slightly, while remaining within specified limits. |                     |  |                                 |

## 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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Due to continual product research and development, the information contained herein is subject to change without notification. Typical Properties may vary slightly.

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