

Mobil Aero HF Series - Aviation Hydraulic Fluids

Aviation Hydraulic Fluids

Product Description

Mobil Aero HFA, HF, and HFS are formulated for aircraft systems where use of hydrocarbon-based hydraulic fluids is required. They are low viscosity products, high VI (viscosity index) fluid with excellent low temperature properties, good anti-wear performance, and good chemical stability. Mobil Aero HFA and HF are composed of mineral base oil stock and contain shear-stable VI improvers; Mobil Aero HFS is a synthetic polyalphaolefin-based fluid.

Features and Benefits

Mobil Aero HF Series aviation hydraulic fluids are designed to meet the demanding requirements of commercial and military aircraft applications. These high quality formulations have a long history of excellent performance and provide long, trouble-free service over a wide range of operating conditions. Product features and potential benefits include:

| Features | Advantages and Potential Benefits |
|---|---|
| High Viscosity Index (VI) | Allows equipment operation over a wide range of temperatures |
| Excellent low temperature properties | Provides high performance operation in low ambient conditions |
| Good chemical and oxidation stability | Resists the formation of acidic constituents, varnishes, and deposits |
| Meets "super clean" requirements of U.S. Spec. Mil-PRF-5606 (Aero HF) or MIL-PRF-83282 (Aero HFS) | Ensures reliable performance of pumps, servo-valves and other hydraulic system components |

Applications

Mobil Aero HFA is a premium quality fluid that meets the requirements of the U.S. Military specification MIL-H-5606A (now obsolete). It has a very high VI and is suitable for use at temperatures down to -54 °C (-65 °F). While this quality fluid is no longer used by the U.S. Military, it is still used in some older, small private, and commercial aircraft. It is also used in industrial and commercial equipment requiring good fluidity at very low temperatures, where Mobil Aero HFA provides long, trouble-free service over a wide range of operating conditions.

Mobil Aero HF is a premium quality fluid that is approved against the most current version of U.S. Military specification MIL-PRF-5606. It has physical properties very similar to Mobil Aero HFA, and also meets "super-clean" requirements required by modern aircraft hydraulic systems. It is intended primarily for military aircraft, but it is also used as a hydraulic fluid for small private and commercial aircraft, and as a strut fluid in landing gear of large commercial aircraft. It is a NATO Code Number H-515 fluid.

Mobil Aero HFS is a synthetic polyalphaolefin lubricant that is approved against the most current version of U.S. Military specification MIL-PRF-83282. It does not contain a viscosity index (VI) improver. It is designed for use at temperatures down to -40°C (-40°F). It provides lower flammability and volatility and improved stability, but has a higher viscosity at low temperature than Mobil Aero HF. It meets the "super-clean" requirements. It is intended primarily for U.S. military aircraft. It is a NATO Code Number H-537 fluid.

Specifications and Approvals

| Mobil Aero Grade | HFA | HF | HFS |
|--------------------------------------|-----|----|-----|
| MIL-H-5606A (obsolete) quality level | X | | |
| MIL-PRF-5606 approved | | X | |
| MIL-PRF-83282 approved | | | X |
| NATO Code H-515 | | X | |
| NATO Code H-537 | | | X |

Typical Properties

| Mobil Aero Grade(1) | Test Method | HFA | HF | HFS |
|---|--------------|-----------------|-----------------|-----------------|
| Color | Visual | Red | Red | Red |
| API Gravity | | 29 | 28.5 | 34.8 |
| Specific Gravity, 60°F/60°F | ASTM D 4052 | 0.882 | 0.881 | 0.851 |
| Pour Point, °C | ASTM D 97 | -66 (-60 max) | -66 (-60 max) | -60 (-55 max) |
| Flash Point, COC, °C | ASTM D 92 | 108 (93 min) | - | 224 (205 min) |
| Flash Point, PMCC, °C | ASTM D 93 | - | 90 (82 min) | - |
| Acid Number, mg KOH/g | ASTM D 664 | 0.04 (0.2 max) | 0.03 (0.2 max) | 0.03 (0.2 max) |
| Barium Content, ppm | ASTM D 5185 | - | 1 (10 max)(2) | 1 (10 max) |
| Kinematic Viscosity, cSt | ASTM D 445 | | | |
| at 205°C | | - | - | 1.1 (1.0 min) |
| at 100°C | | 5.1 | 5.1 (4.9 min) | 3.5 (3.45 min) |
| at 40°C | | 13.9 | 13.8 (13.2 min) | 14.2 (14.0 min) |
| at -40°C | | 450 (500 max) | 450 (600 max) | 2000 (2200 max) |
| at -54°C | | 1950 | 1950 (2500 max) | - |
| at 130°F | | 10.4 (10.0 min) | - | - |
| Viscosity Index | ASTM D 2270 | 370 | 370 | 128 |
| Low Temperature Stability | FTM 791.3458 | | | |
| 72 hours at -54°C | | Pass | Pass | - |
| 72 hours at -40°C | | - | - | Pass |
| Copper Corrosion, 72 hours at 135°C | ASTM D 130 | 2e max | 2e max | - |
| Oxidation Corrosion Stability, 168 hours at 135°C | ASTM D 4636 | Pass | Pass | Pass |
| Water Content, Karl Fischer, ppm | ASTM D 6304 | 40 (100 max) | 40 (100 max) | 70 (100 max) |

| Mobil Aero Grade(1) | Test Method | HFA | HF | HFS |
|--|--------------------|-----------------|-----------------|-----------------|
| 4-Ball Wear Scar, 1 hour, 1200 rpm, 75°C, 40 kg, mm | ASTM D 4172 | 0.8 (1.0 max) | 0.8 (1.0 max) | 0.53 (0.65 max) |
| Evaporation Loss, wt % | ASTM D 972 | | | |
| 6 hours at 71°C | | 15 (20 max) | 15 (20 max) | - |
| 6.5 hours at 205°C | | - | - | 11 (20 max) |
| Particle Count | Auto Counter | | | |
| 5-15 microns | | | 10000 max | 10000 max |
| 15-25 microns | | | 1000 max | 1000 max |
| 25-50 microns | | | 150 max | 150 max |
| 50-100 microns | | | 20 max | 20 max |
| 100+ microns | | | 5 max | 5 max |
| Particulate Contamination, mg/100 mL | ASTM D 4898 | | 0.1 (0.3 max) | 0.2 (0.3 max) |
| Filtration Time, minutes/100 mL | FTM 791.3009 | | 3 (15 max) | 4 (15 max) |
| Foam, Seq I, mL/mL | ASTM D 892 | 30/0 (65/0 max) | 30/0 (65/0 max) | 10/0 (65/0 max) |
| Nitrile Rubber L Swell, 168 hours at 70°C, % | FTM 791.3603 | 19.0 to 30.0 | 19.0 to 30.0 | 18.0 to 30.0 |
| Shear Stability, Option B, Loss in KV at 40°C, % | ASTM D 2603 | 15 max | 15 max | - |
| Bulk Modulus, Isothermal Secant at 40°C, 4,000 psig, psi | | 200,000 min | 200,000 min | - |
| Bulk Modulus, Isothermal Secant at 40 °C, 10,000 psig, psi | | - | - | 200,000 min |
| (1) Values not identified as min/max are typical and may vary within modest ranges | | | | |
| (2) Applies to product approved against MIL-PRF-5606H | | | | |

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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