# BIOFLO HEES

**Overview:** BioFlo HEES is a fully synthetic, ester based hydraulic fluid. It meets the OECD standard 301-B and is designed to provide better performance in extreme temperatures and over extended periods of time. It offers high thermal and oxidative stability which reduces operating temperatures. Friction and wear of parts is minimized in industrial and mobile hydraulic systems. Readily available for delivery worldwide. Available in ISO grades 32, 46, 68.

## Specifications, Approvals, Recommendations:

- USDA BioPreferred Program
- Classified as Environmentally Acceptable Lubricants (EAL's) as per the EPA's 2013 U.S. Vessel General Permit (VGP)

| Physical Properties | HEES 32 | HEES 46 | HEES 68 |
|---|---|---|---|
| **ISO Grade** | 32 | 46 | 68 |
| **Specific Gravity,** ASTM D1298 | 0.87 | 0.87 | 0.89 |
| **Viscosity,** ASTM D445 @40°C, cSt<br>**Viscosity,** ASTM D445 @100°C, cSt<br>**Viscosity,** ASTM D445 @-30°C, cSt | 32<br>6.3<br>3,500 | 46<br>8.7<br>3,628 | 68<br>11.2<br>3,714 |
| **Viscosity Index (VI),** ASTM D2270 | >180 | >180 | >180 |
| **Pour Point, ASTM D97,** °F (°C) | -63 (-53) | -63 (-53) | -53 (-47) |
| **Flash Point, ASTM D92,** °F (°C) | >590 (310) | >590 (310) | >570 (299) |
| **FZG Load Stage,** DIN 51354 | 12 | 12 | 12 |
| **Copper Corrosion,** ASTM D4048 | 1A | 1A | 1A |
| **Rust Test,** ASTM D665, A & B | PASS | PASS | PASS |
| **Demulsibility,** ASTM D1401, 15 minutes | 40-40-0 | 40-40-0 | 40-40-0 |
| **Dielectric Breakdown Voltage,** ASTM D877, kV | >55 | >55 | >55 |
| **Environmental Stewardship: Meets EPA requirements to be classified as an EAL per the 2013 VGP** | | | |
| **Readily Biodegradable** (meaning>60%)<br>**OECD 301B,** % in 28 day<br>**OECD 301B,** % in 10 day window | PASS<br>>85<br>>69 | PASS<br>>85<br>>69 | PASS<br>>80<br>>67 |
| **Minimally Toxic**<br>**OECD 201** - Algae (EC 50), 72 hr, mg/L<br>**OECD 202** - Daphnia (EC 50), 48 hr, mg/L<br>**OECD 203** - Fish (LC 50), 96 hr, mg/L | PASS<br>>13,000 mg/L<br>>25,000 mg/L<br>>50,000 mg/L | PASS<br>>13,000 mg/L<br>>25,000 mg/L<br>>50,000 mg/L | PASS<br>>13,000 mg/L<br>>25,000 mg/L<br>>50,000 mg/L |
| **Not Bioaccumulative*** (*Calculated value as per EPA standard) | PASS | PASS | PASS |
| **Additional Environmental Features and Characteristics** | | | |
| **Bio-based Content,** ASTM D6866, % | >95 | >95 | >98 |

**Applications & Industries:** Any industry (construction, refuse, mining, dredging, marine, agriculture, oil & gas, plant operations, etc.) utilizing mobile or stationary hydraulically powered equipment, especially hydraulic systems where a release into the environment is possible or where a leak or spill could reach a waste stream.