



BIO-HYDRAULIC

Irving **BIO-HYDRAULIC** is an environmentally friendly fluid designed for all hydraulic systems working in sensitive areas where spills and leaks must have the least possible effect on animal and plant life. This has been achieved by using special biodegradable vegetable and synthetic base oils and by choosing additives with low toxicity, all without sacrificing the levels of performance that industrial customers require from their hydraulic oils.

Features

Irving **BIO-HYDRAULIC** meets or exceeds the following manufacturers and industry test standards:

- Hagglunds Denison HF-0, HF-2, HF-6 including P-46 (piston) and T5D-42 (vane) pump tests
- Vickers M-2959-S, using 35 VQ 25 vane pump in both standard (50 hours) and extended (300 hours) tests
- ASTM D-2882, using Vickers V104C vane pump
- CEC L-33-T-82, readiness of biodegradation
- OECD 301B (modified Sturm), readiness of biodegradation
- Rexroth RE 90221
- 200 Minute RBOT

Benefits

- Excellent all-round performance
- Biodegradable with low toxicity
- Wide operating temperature range — natural multigrade
- Suitable for all types of pumps, even those with silver-plated parts

The base oil mix has excellent stability and its oxidation resistance is enhanced with a special low-toxicity additive. It was judged to be particularly important that this fluid provide wear-prevention ability at least as good as premium mineral-based hydraulic oil, and this has been achieved without the use of toxic zinc-containing components. Irving **BIO-HYDRAULIC** oil meets or exceeds all the major pump manufacturers toughest fluid requirements: These demonstrate fluid life, wear prevention, hydrolytic stability, filterability, foam resistance, water separation and rust prevention — all important characteristics for high-performance, top-quality hydraulic fluid.

Irving **BIO-HYDRAULIC** oil has the wide operating temperature range typical of a multi-graded mineral oil. Although it has a nominal ISO* grade of 46, it offers the low-temperature fluidity of an ISO 32 grade and the high temperature viscosity of an ISO 100 grade. Furthermore, this product will retain these characteristics, unlike some multi-graded mineral oils, in the high-shear environment of a typical hydraulic system.

Biodegradability of the whole fluid has been tested according to two accepted standards, and toxicity is well below the current recommended limits.

*ISO: International Standards Organization



Typical Performance Results

ISO GRADE	46
SPECIFIC GRAVITY @ 15.6°C	0.92
VISCOSITY (D-445) cSt @ 40°C cSt @ 100°C	49 10.5
VISCOSITY INDEX (D-2270)	209
BROOKFIELD VISC. (D-2983) cP @ -25°C cP @ -25°C (after 3 days) cP @ -25°C (after 5 days)	3500 11500 13000
POUR POINT (D-97) (°C)	-33
FLASH POINT (D-92) (°C)	278
USEFUL OPERATING RANGE (°C)	-14/90
LOWEST COLD START TEMP. (°C)	-30
HYDROLYTIC STABILITY (D-2619) wt. lost (mg/cm ²) acidity of water layer (mg of KOH)	0.0 (0.2 max. allowed) 0.21 (4.0 max. allowed)
FOAM PREVENTION (D-892) Sequence I (tendency/stability) Sequence II (stability/stability) Sequence III (stability/stability)	0/0 10/0 0/0
RUST PREVENTION (D-665A) Distilled water (D-665B) Synthetic sea water	PASS PASS
DEMULSIBILITY (D-1401) @ 54.4°C, oil - water - emulsion (mins)	40 - 40 - 0 (10)
COPPER CORR. PREV. (D-130) Copper strip, 3 hours @ 100°C	1a
OXIDATION RESISTANCE (D-2270) RBOT, mins. to 25 psi loss	197
WEAR PREVENTION: 4-Ball Method (D-2266) 75°C, 40 Kg., 1 Hr., @ 1200 rpm, scar diam.(mm)	0.36

Available Package Sizes

BIO-HYDRAULIC 46

- 20 L (5.28 US gal.) Pail
- 210 L (55.5 US gal.) Drum
- Bulk

