HYDRAULIC OILS

RANDO® HD PREMIUM OIL MV

The demands on your equipment, time and bottom line multiply daily. Rando® HD Premium Oil MV helps keep your equipment operating longer, faster and harder, allowing you to maximize the time between required maintenance and helps reduce or eliminate catastrophic (and expensive) equipment failures.

Take Advantage of the Latest Technology

With Rando® HD Premium Oil MV, you can take advantage of additive and base oil technology that provides multi-viscosity (5W-20 / 200 VI) and robust protection of hydraulic pumps.

Applications

Rando HD Premium Oil MV meets requirements of:

- MAG Cincinnati, Cincinnati Machine P-68 (32)
- SAE MSI004 HM (ISO 32)
- Bosch Rexroth (ISO 32)
- DIN 51524-3 (ISO 32)
- ISO 11158 HV (ISO 32)
- ASTM D6158HV (ISO 32)

Rando® HD Premium Oil MV, our top-of-the-line, multi-viscosity, zinc additized, anti-wear hydraulic oils, are formulated to provide you with:

Multi-viscosity (5W-20) that provides up to 4 percent in overall hydraulic pump efficiency

Capability for wide operating temperatures (high viscosity index)

Long service life for both the lubricant and your equipment

Excellent protection against wear, rust and corrosion of critical hydraulic system components

Outstanding air release, foam control and water separation

Excellent thermal stability

Excellent shear stability

Typical dielectric strength of 35 kV[1] (ASTM D877[2])

A **Chevron** company product

Water Separation Test

Water enters hydraulic systems in a number of ways – through condensation, poor sealing, leaks in cooling circuits, or rain. This can lead to increased wear, filter plugging, and corrosion of hydraulic equipment. That's why it's important to use an oil that sheds water quickly and fully. Rando® HD Premium Oil MV allows you to readily remove free water from your hydraulic system without having to change out the oil.

Water Separation Test	ASTM D1401-10 Standard Test Method for Water Separability of Petroleum Oils and Synthetic Fluids.
Test Procedure	40 ml of oil and 40 ml of water are stirred at 1,500 rpm for 5 minutes at 54°C in a graduated cylinder. 100 grade and higher oils are run at 82°C. The separation time of the oil and water emulsion is recorded. The volumes of oil, water and emulsion are monitored at five-minute intervals and recorded. The test is generally run for duration of 30-60 minutes depending on the oil's test temperature and viscosity.
Limits	3 ml maximum emulsion in 10 minutes [Parker Hannifin (Denison) HF0].
Results	0 ml emulsion in 10 minutes.

Air Release Test for Hydraulic Oils

The operation of hydraulic systems creates turbulent conditions that produce air bubbles that can disperse into the lubricant. If the oil does not allow the air bubbles to rise to the oil surface quickly enough while in the reservoir, a mixture of air and oil will circulate through the lubricating oil system. This can result in an inability to maintain oil pressure (particularly with centrifugal pumps), incomplete oil films in the pumps/motors, bearings and gears, as well as poor hydraulic system performance or even failure. Rando® HD Premium Oil MV is formulated to disperse air bubbles quickly to provide your equipment with smooth, precise hydraulic action.

Test Method

ASTM D3427-07 Standard Test Method for Air Release Properties of Petroleum Oils.

Test Procedure

Compressed air is blown through 180 ml of the test oil, which has been heated to a specified temperature (25°, 50° and 75°C are standard temperatures) for 7 minutes. The time that it takes for the oil to release all but 0.2 percent by volume of the air is then measured.

Limits

7 minutes maximum at 50°C [Parker Hannifin (Denison) HF0 requirement for ISO 46 grades].

Results

Less than 1 minute at 50°C.

Cincinnati Machine Thermal Stability Test for Hydraulic Oils

The Thermal Stability Test determines the ability of hydraulic oils to resist breakdown at high temperatures in the presence of copper and steel. This test method was developed to assess the thermal stability of various anti-wear agents, primarily zinc dialkyldithiophosphates (ZDDP).

ZDDP can decompose at high temperatures. As decomposition occurs, the resulting reaction can form by-products that enhance oxidative and corrosive tendencies, which can attack the copper and steel components present in piston and vane pumps.

Test Method

Cincinnati Machine Thermal Stability Test Procedure A (formerly Cincinnati Milacron), ASTM D2070-10.

Test Procedure

A sample of the test lubricant and pre-weighed copper and steel test rods are placed in a beaker and heated at 135°C for 168 hours (1 week). At the end of this test period, the copper and steel rods are weighed and rated visually and the oil is analyzed for sludge and viscosity change.

Limits

Total Sludge, mg/100ml	25.0 Max
Copper Weight Loss, mg/200ml	10.0 Max
Viscosity Change @ 40°C, %	5.0 Max

Results

Total Sludge, mg/100ml	1.15
Copper Weight Loss, mg/200ml	0.2
Viscosity Change @ 40°C, %	0.35

For more information, go to www.chevronlubricants.com

[1] Dielectric strength value applies only to "point of manufacture" of packaged products produced at a Chevron manufacturing facility. (Does not apply to bulk packaging). The oil will quickly lose its high dielectric strength value when exposed to contamination and to very small amounts of moisture and water.
[2] Industry standard test method for measuring kV values is not precise and test results can differ significantly.

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