

# Conoco PowerDrive<sup>®</sup>

Next-generation TO-4 fluid to power and protect heavy-duty equipment.



**CONOCO**®



# More power to move mountains. More reasons to use PowerDrive®.

For more than 20 years, mining and construction operators have relied on Conoco PowerDrive Fluid to run their heavy-duty equipment. Today's working conditions are more demanding than ever. Machinery runs hotter, faster and longer, under heavier loads and in tougher conditions. Fortunately, PowerDrive Fluid has also become tougher.

Purpose-built for industry demands and formulated with a remarkable additive, next-generation PowerDrive Fluid lets you haul bigger loads with less gear and pump wear, which boosts productivity and your bottom line. It also enhances the performance of final drives, transmissions, wet brakes, steering and hydraulic systems.

## WHY CONOCO® POWERDRIVE FLUID IS RIGHT FOR YOUR EQUIPMENT:

- Superior wear and load protection
- Industry-leading friction performance
- Corrosion protection
- Oxidation stability



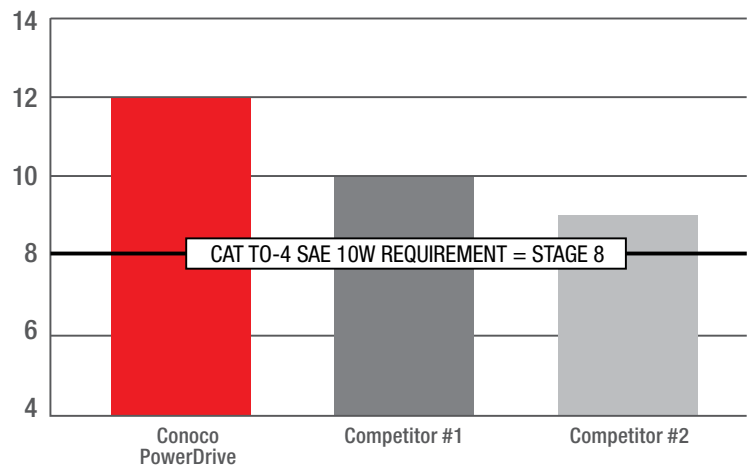
## Wear and Load Protection

Our purpose-built fluid is formulated to provide excellent wear and load protection without compromises to copper corrosion or friction.

### POWERDRIVE FLUID:

- Improves load-carrying capacity
- Protects final drive gear sets against heavy loading for longer gear life
- Reduces unscheduled gear replacement downtime

## EP Protection FZG A20/8.3/9/90



The FZG Load Stage Test runs oil under increasingly high loads until wear materializes. Gears are assessed after every load. The stage at which the oil is no longer capable of protecting the gear is called the failing load stage. As the chart clearly shows, PowerDrive goes beyond standard requirements and outperforms competing oils in this test.

## Friction Protection

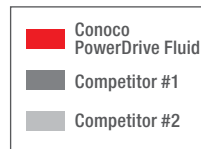
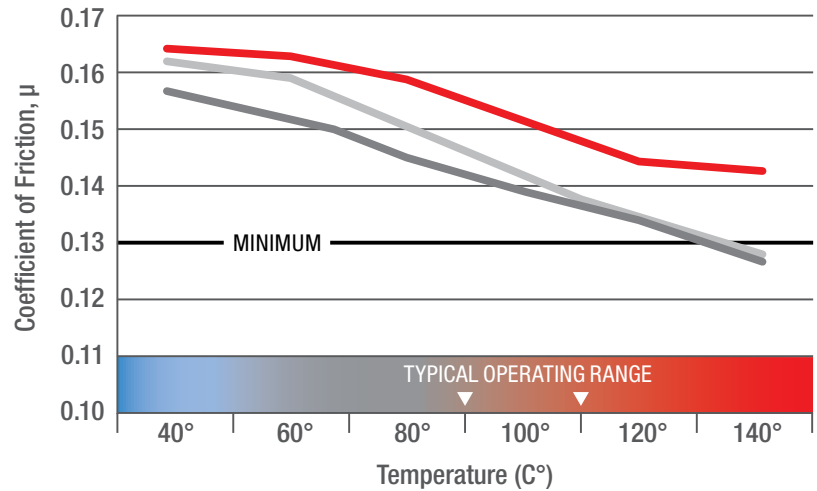
Powershift transmissions and wet brake applications demand fluids with great friction characteristics. PowerDrive is formulated for smoother engagement of the clutch disc and drive plate, thus minimizing slippage that can produce extreme heat and cause breakdowns. Unchecked slippage can result in even higher temperatures that can cause disc warping and total clutch failure.

### POWERDRIVE FLUID:

- Allows precise clutch engagement over a wider temperature range (40°C–140°C)
- Provides smooth, quiet, shudder-free wet brake action
- Improves power transmission shifting for smoother operation

## Friction Performance

Komatsu Micro Clutch Test



As demonstrated here in the Komatsu Micro Clutch Test, PowerDrive Fluid outperforms competing products with regard to maintaining friction during continued brake and transmission performance throughout rigorous work cycles.

FRRET (friction retention) tests measure the ability of the fluid to protect friction parts from damage under long-term and extreme use. After a double-length FRRET test, the now aged oil underwent a one-day Sequence 1220 endurance test for new oils. The results on sintered bronze were impressive, showing the protective power of Torque Fluid.



Conoco PowerDrive  
Profile of grooves still strong despite severe test



Competitor #1  
Heavy wear to plates, grooves worn, deep scratch



Competitor #2  
Extreme wear, almost no profile remains on the friction plate

## Corrosion Protection

Even in the most extreme environments, PowerDrive protects against corrosion that can compromise performance and lead to higher maintenance costs and field failure.

### POWERDRIVE FLUID:

- Guards yellow metal parts against corrosion and deposits
- Helps extend the life of clutch discs and thrust washers
- Improves efficiency of your hydraulic system

## Copper strip after ISOT

(96 hrs. @ 150°C)



Conoco  
PowerDrive Fluid



3 Different Competitive Fluids

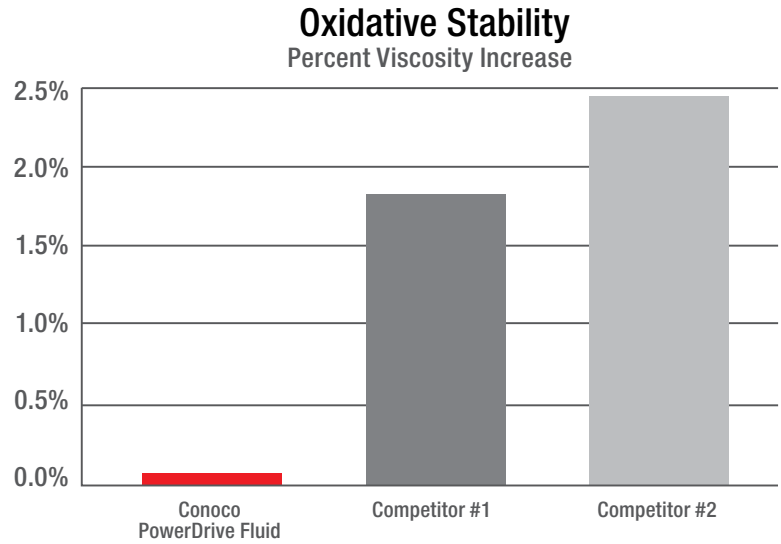
A visual inspection of copper strips following this OEM bench test to simulate aging of oil shows that PowerDrive Fluid outperforms competitive fluids in protecting against corrosion. Similar results were found in the Komatsu Amihot Oxidation Test, where test plates are subjected to 20 hours at 165°C with air bubbled through to simulate aging.

## Oxidation Stability

Oxidation stability is critical to increased service life. As oxidation occurs, sludge is formed, which increases viscosity and produces heat that accelerates oxidation and decreases oil life. Better oxidation control means longer oil life and less sludge.

### POWERDRIVE FLUID:

- Fights oxidation and limits viscosity increases
- Keeps hydraulic systems clean and operating at peak efficiency
- Protects valves from varnish and deposits



Testing reveals that PowerDrive is an oxidatively stable fluid with minimal increases in viscosity compared to competing fluids.

## Conoco® PowerDrive Fluid protects equipment where it counts

### FINAL DRIVE PROTECTION:

Reduces wear and enhances gear protection under extreme loads

### FRICITION CONTROL:

Provides quiet wet braking and precise transmission engagement over a wide temperature range

### CORROSION PROTECTION:

Guards yellow metal parts against corrosion and deposits

### OXIDATION STABILITY:

Increases equipment service life by resisting oxidation and keeping engines clean

SAE GRADE	ADVANTAGES
<b>10W</b>	<ul style="list-style-type: none"> <li>• Keeps hydraulic systems clean and operating at peak efficiency</li> <li>• Protects pressure, flow and directional valves against varnish and deposits</li> </ul>
<b>30</b>	<ul style="list-style-type: none"> <li>• Smooth shifting and engagement of transmission components</li> <li>• Enhanced wear protection for clutches and gears</li> </ul>
<b>50</b> <b>60</b>	<ul style="list-style-type: none"> <li>• Protects final drive gear sets under extreme loading conditions</li> <li>• Minimizes unscheduled downtime</li> </ul>



Make the switch to next-generation PowerDrive® Fluid. Contact a technical representative at **877.445.9198** or visit **[phillips66lubricants.com](http://phillips66lubricants.com)**