



Varnish Resistant, High VI Hydraulic Fluid

Application: Hydraulic Excavator for Open Cut Mining

Location: Australia

Challenge

Hydraulic fluids in large hydraulic excavators are subject to extreme working conditions. Regular hydraulic fluids are vulnerable to the high temperatures and pressures seen in these systems and can degrade quickly leading to increased friction, wear, and varnishing. Not only does this negatively impact lubricant life, it also requires machines to draw more energy and can increase hydraulic excavator downtime, all of which increases the operators total cost.

Solution

FUCHS has developed RENOLIN XTREME TEMP 46, a high-performance hydraulic fluid with premium base oils and additives to give the following benefits:

- Significantly resists drop in viscosity at high temperatures (high viscosity index) maintaining necessary hydrodynamic lubrication.
- Shear stable
- Oxidation resistant
- Varnish resistant

Results

The use of RENOLIN XTREME TEMP 46 in these large hydraulic excavators showed significant performance improvements over the competitors premium hydraulic fluid. RENOLIN XTREME TEMP 46 reduced component wear by maintaining a higher viscosity at elevated temperatures which also decreased overall system temperatures. The shear stable additive package maintained a high VI for the life of the fluid, thus extending its serviceable life, reducing overall lubricant consumption, and reducing total costs. Used Oil Analysis also showed a sustained reduction in varnish potential (via MPC) after switching to RENOLIN XTREME TEMP 4 which ensures the lubricating film is not lost.

Advantages

Reduced component wear

Reduced operational costs

Resists oxidation, sludge and varnish

CASE STUDY

Field data from multiple fleets of Hitachi mining excavators shows:

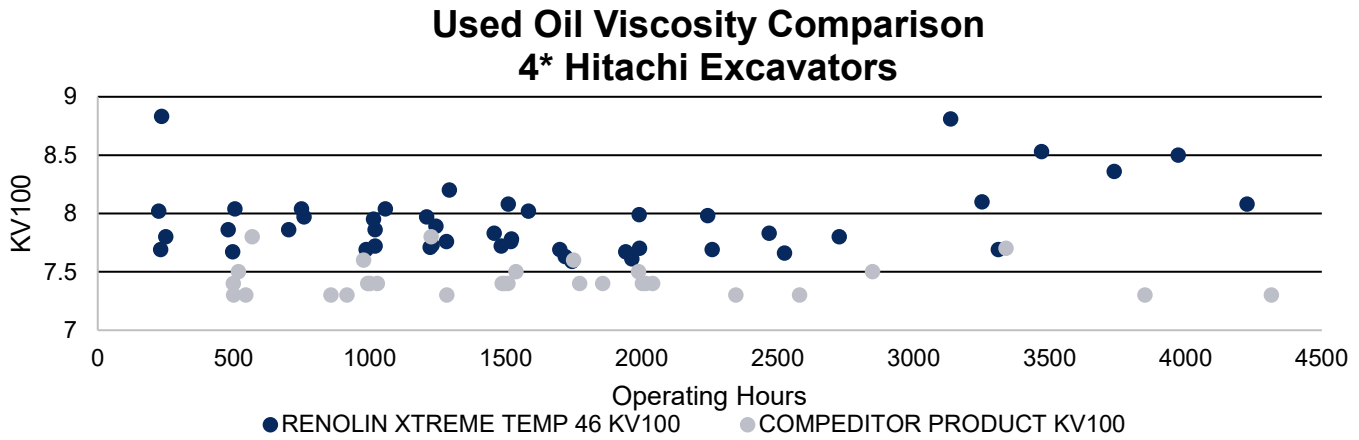


Figure 1: Viscosity Comparison. Note that RENOLIN XTREME TEMP 46 maintains a higher KV100, assisting in reducing component wear.

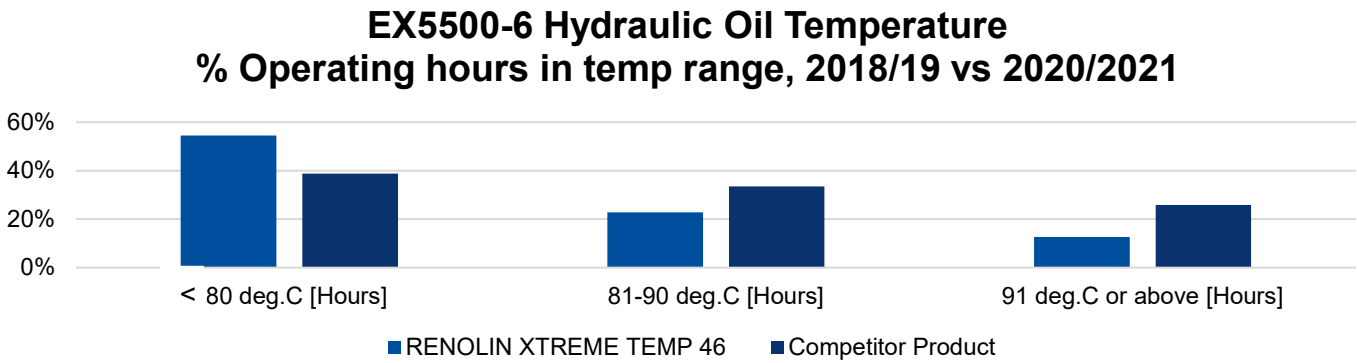


Figure 2: Hydraulic oil temperature comparison. Data from 2018/19 summer running competitor's product, and 2020/21 summer running FUCHS RENOLIN XTREME TEMP 46

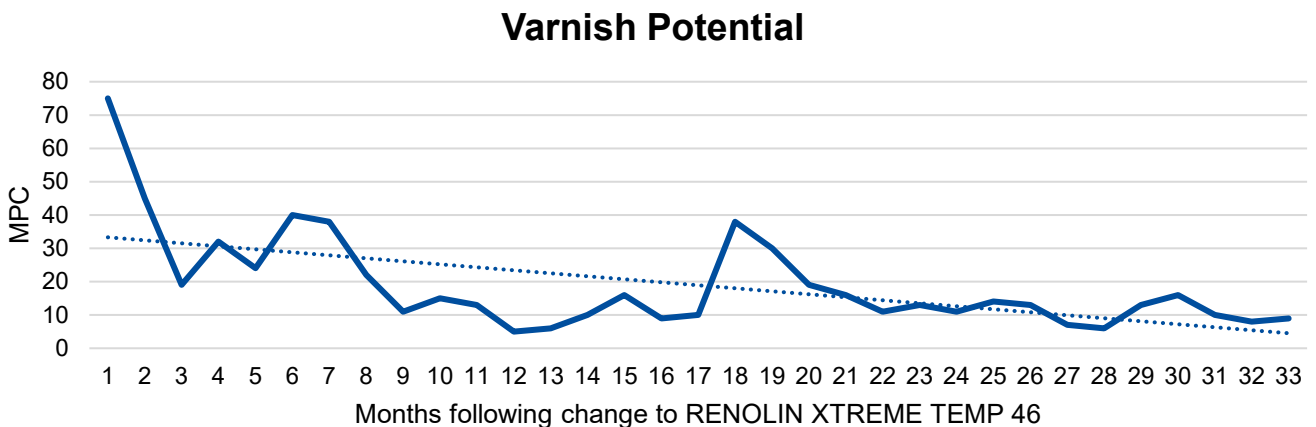


Figure 3: MPC Varnish Potential showing a sustained reduction following the change to RENOLIN XTREME TEMP 46