PRODUCT BULLETIN

ENERLUBE M™

ENERLUBE M™
POTENT LOW-DOSAGE LUBRICANT

PRODUCT DESCRIPTION

EnerLube is an ester-based liquid lubricant derived from natural fats and oils.

EnerLube M™ is designed to reduce metal on metal friction cost-effectively. It is effective at low doses and when used as a slug. It is salt tolerant and still effective in high TDS brines and can be used in drilling, workover, and completion scenarios.

PRODUCT FEATURES AND BENEFITS

- Highly effective and reliable at low dosages in produced water and brine-based systems.
- Also compatible with freshwater drilling fluids and low pH SAGD drilling fluids.
- Formulated for bitumen compatibility; will not exacerbate accretion and will not contribute to washout in organic-rich formations.

RECOMMENDED TREATMENT

EnerLube is typically used as a slug or sweep in brine-based systems. It is also used to treat freshwater/SAGD polymer at 0.5-2% (5-20 L/m^3).

LUBRICITY LABORATORY TEST RESULTS

The lubricity (in terms of coefficient of friction - CoF) of **EnerLube M**™ was measured by the world-class Bruker UMT unit. The steel-on-steel test was carried out with a SAGD Analog fluid (Baseline fluid). **EnerLube M**™ was progressively added to the baseline fluid, and the corresponding CoF values were measured.

The CoF values were measured by the Bruker UMT with a force of 300 N at 60 rpm for 5 minutes, and the steady-state CoF was averaged and recorded.

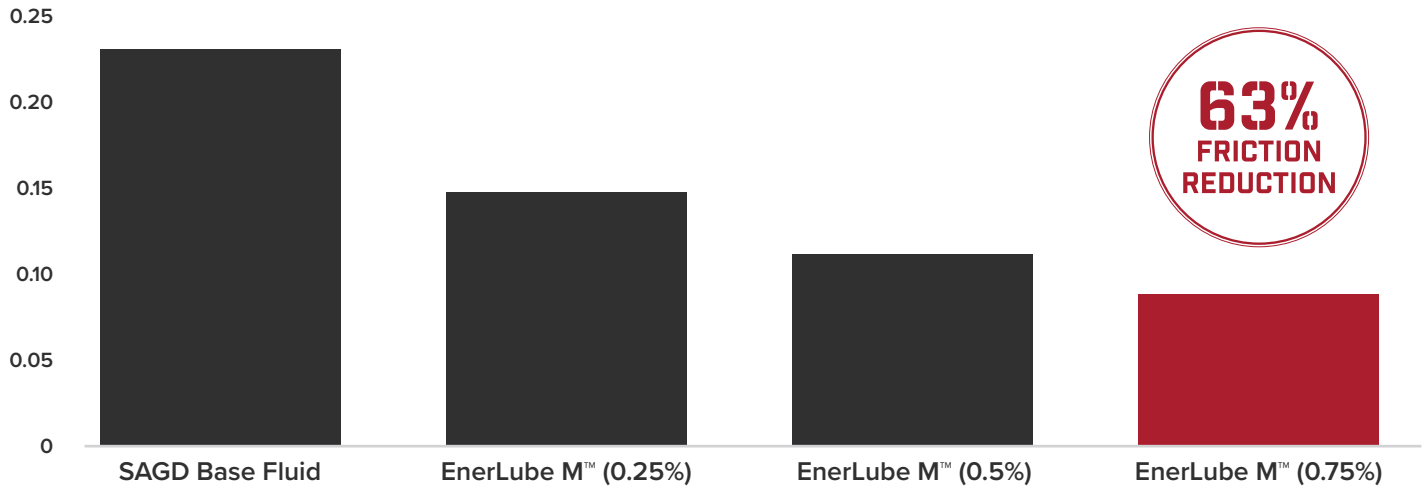
Experimental results showed that **0.75 % (V/V) of Enerlube M™ reduced friction by over 63%**. **EnerLube M**™ is highly effective at low doses; even at concentrations as low as 0.75% (V/V), **EnerLube M**™ is still very potent.

Our Bruker UMT Unit

The Canadian Energy Services Bruker unit is the ***only*** industry-exclusive advanced tribology unit in North American drilling fluids laboratories.

Also used by NASA and the US Military, the German-engineered Bruker UMT unit has been vital to the appraisal and development of renowned and specialized lubricants.

COEFFICIENT OF FRICTION VALUES



CASE STUDY I

TERMINATING TORQUE IN PRODUCTION WATER BRINE LATERALS

LOCATION: GRANDE PRAIRIE, AB, CANADA
TARGET FORMATION: MONTNEY

CHALLENGE

While using produced water, an operator drilling in the Montney torqued out and had high friction factors that hampered their drilling ROPs and efficiency. The drilling fluids were being provided by a competitor. The initial approach to mitigate the problem involved utilizing their proprietary lubricant followed by a switch to a well-known industry standard lubricant (Radiagreen™). However, this proved unsuccessful due to the variability in production water chemistry. There was no positive result on the torque or friction factors after the continuous application of multiple drums of these lubricants.

SOLUTION

Canadian Energy Services (CES) was asked to come in and provide an effective lubricant for that competitor's well since multiple lubricants proved ineffective in their Production Water solids-free system. CES recommended the use of **EnerLube M**™ to solve the problem.

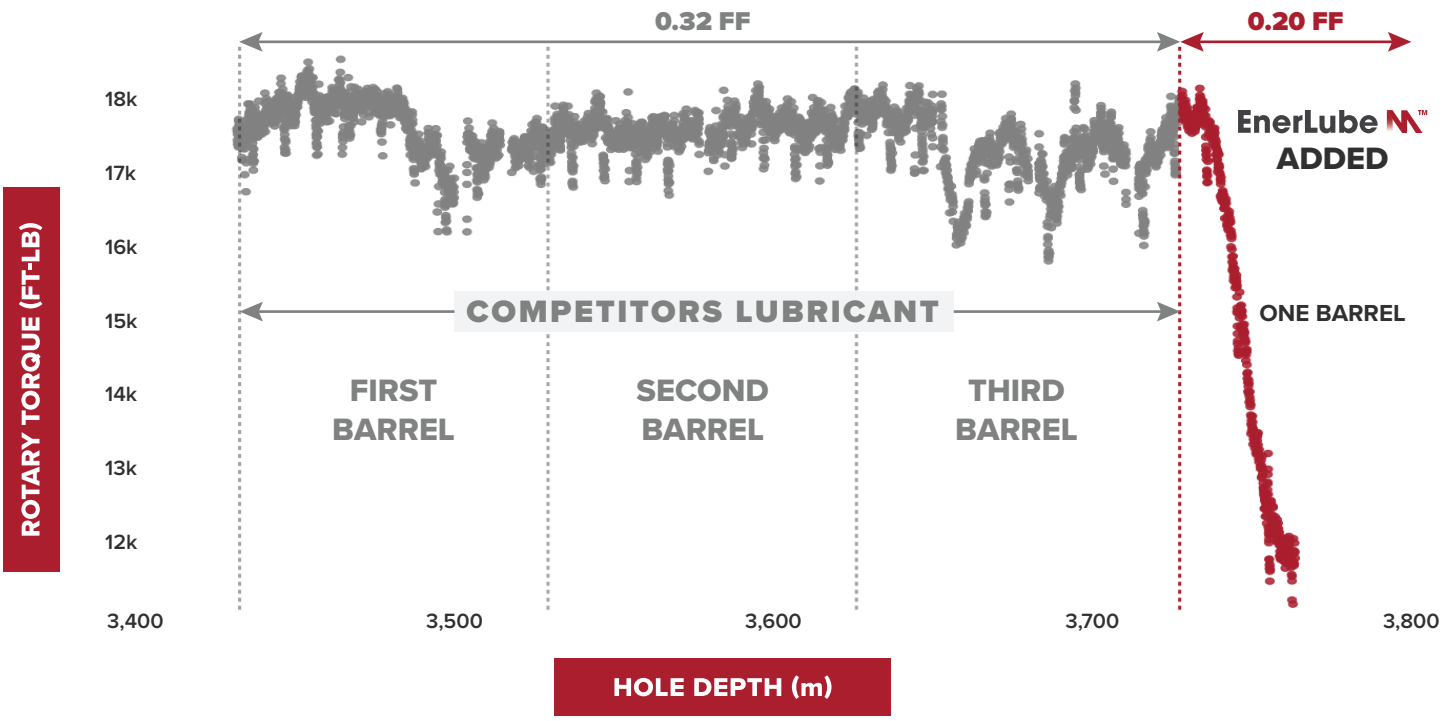
RESULTS

Upon switching to **EnerLube M**™, rapid reduction in torque was observed. The superior performance of **EnerLube M**™ was also evident in the increase of the average Rate of Penetration (ROP) due to the reduction in hole drag and increased weight transference to the bit. Furthermore, Torque and Drag analysis carried out by our technical experts showed a decrease in the Friction Factor from 0.32 to 0.20 after the switch to **EnerLube M**™.

LATEST FIELD RESULTS

- **-40%** REDUCTION IN TORQUE
- **-38%** REDUCTION IN FRICTION FACTOR
- **+20%** INCREASE IN ROP

THE ENERLUBE M™ EFFECT ON TORQUE AND DRAG



CASE STUDY II

TIME AND COST SAVINGS IN A COIL TUBING OPERATION

CHALLENGE

An operator needed to improve their coil tubing milling operation on a five-well Montney Pad in Northeast BC. They were experiencing high lubricant costs and long milling time in the hole. They needed a cost-effective solution that would reduce the milling time spent in the hole.

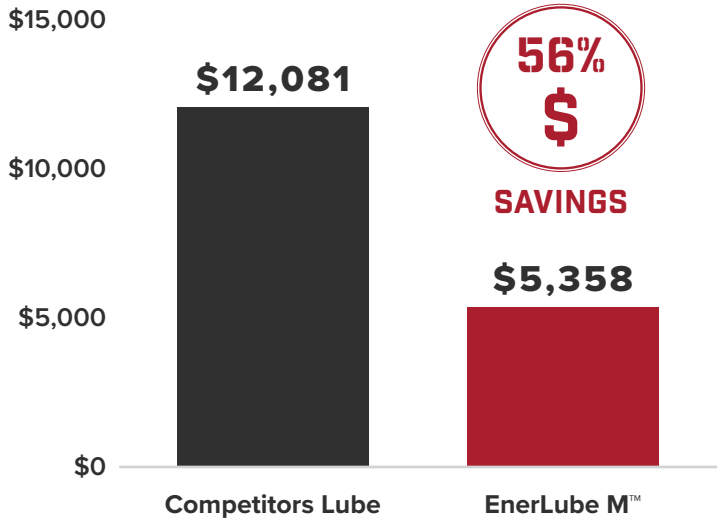
SOLUTION

Canadian Energy Services (CES) recommended using **EnerLube M**™ to optimize the coil tubing milling operation and solve the problem. **EnerLube M**™ was trialled against the incumbent's lubricant on their next coil tubing milling operation.

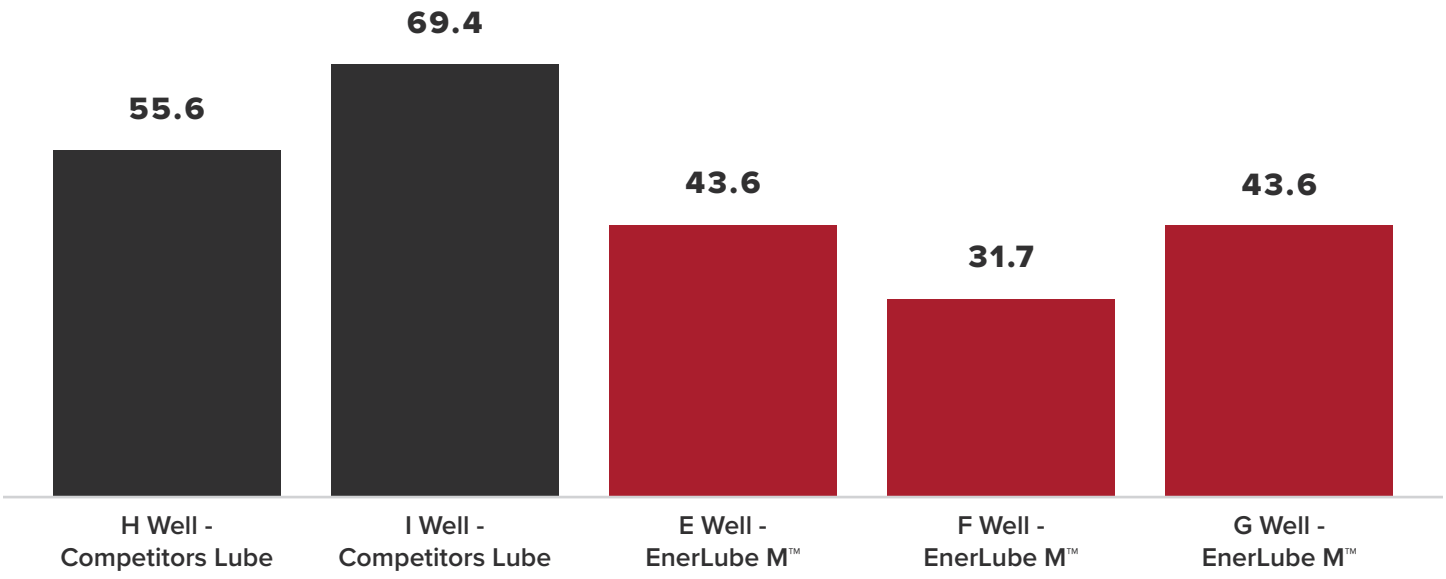
RESULTS

The field results showed less time spent on operations and over 50% on liquid lubricant cost savings. The average milling time was reduced from 62.5 hours to 39.6 hours, a 37% reduction.

AVERAGE LUBRICANT SPEND PER WELL



MILLING TIME IN HOLE (HOURS) - 5 WELL PAD



EnerLube M™