

# SAFE-LUBE

## SAFE-LUBE\* additive is a patent-pending, water-soluble brine lubricant.

The novel chemistry demonstrates exceptional reduction in metal-to-metal friction when added to brine-base completion fluids at extremely low concentrations.

### Typical Physical Properties

Physical appearance .....	Clear liquid
Specific gravity .....	1.01 @ 60°F (16°C)
pH .....	6.5
Solubility.....	100%

### Applications

SAFE-LUBE lubricant is designed to reduce the coefficient of friction in seawater, sodium chloride, sodium bromide, calcium chloride and calcium bromide completion fluids.

Torque and drag in completion fluids in high-angle, extended-reach wells has become a major concern to completion operations. SAFE-LUBE lubricant has reduced torque and drag up to 50% at extremely low concentrations in field applications.

The optimum concentration of SAFE-LUBE lubricant is one drum per 218 barrels (0.6% by volume). The product can be added before the fluid passes through a DE filter press or cartridge unit. SAFE-LUBE lubricant will not be removed by the filtration process.

CoF data derived from tests using the OFI Digital Lubricity tester at 60 rpm and 150 inch-pounds torque gave the following results:

Brine	CoF	CoF with 0.6% SAFE-LUBE
Seawater	0.36	0.08
Seawater with 3 % KCl	0.37	0.09
9.0 lb/gal KCl	0.38	0.08
10.0 lb/gal NaCl	0.37	0.08
10.7 lb/gal CaCl <sub>2</sub>	0.26	0.13
11.6 lb/gal CaCl <sub>2</sub>	0.09	0.08
11.2 lb/gal CaCl <sub>2</sub> / CaBr <sub>2</sub>	0.11	0.09
12.2 lb/gal CaBr <sub>2</sub> (20 TCT)	0.15	0.04

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### Advantages

- Return permeability testing has shown that SAFE-LUBE lubricant is not damaging to the formation.
- Completion fluid oil and grease values are not elevated with as much as 10 times the recommended concentration of SAFE-LUBE lubricant.
- SAFE-LUBE lubricant does not contribute a sheen in a Static Sheen Test.
- Soluble in most completion brines
- Effective at low concentration (0.6% by volume)
- Filtration operations are not adversely impacted by addition to brine.

### Limitations

Not to be used with zinc-base fluids

Add product directly to mud pit, do not add through a hopper as excessive foaming may occur

### Toxicity and Handling

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions as described in the Material Safety Data Sheet (MSDS).

### Packaging and Storage

SAFE-LUBE lubricant is packaged in 55-gal (208-L) drums.

Store above freezing temperature in a dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, shrink-wrapping and/or stacking.

No claim of personal safety is intended nor implied by the use of the name SAFE in this product. Personnel handling this material should read and follow all safety and handling procedures set forth on the Material Safety Data Sheet.



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