

PALAYESH PARAFFIN KHAVARAN

Improves performance, extends thermal life and reduces cost



Proven safe and effective for deepwater operations

KHP-G is a safe, naturally occurring hydrocarbon resin with unique chemical properties. Added to drilling fluids, it increases performance and reduces cost in deepwater drilling while minimizing risk.

| | EPA Static Sheen | 96 Hours LC50 Aquatic Bioassay >30,000 ppm SPP | EPA (RPE) Fluorescence | GCMS Crude Oil <1% | Sediment Toxicity 1.0 |
|---------------------------|-------------------|--|--------------------------|--------------------|-----------------------|
| Synthetic-Based Mud (SBM) | ✓ Pass (No sheen) | ✓ Pass (929,380) | ✓ Pass (No fluorescence) | ✓ Pass (0.06) | ✓ Pass (0.3) |
| SBM + 3 ppb KHP-G | ✓ PASS (No sheen) | ✓ PASS (933,350) | ✓ PASS (No fluorescence) | ✓ PASS (0.06) | ✓ PASS (0.22) |
| SBM + 6 ppb KHP-G | ✓ PASS (No sheen) | ✓ PASS (890,670) | ✓ PASS (No fluorescence) | ✓ PASS (0.06) | ✓ PASS (0.22) |

The deeper you look, the more benefits you'll see

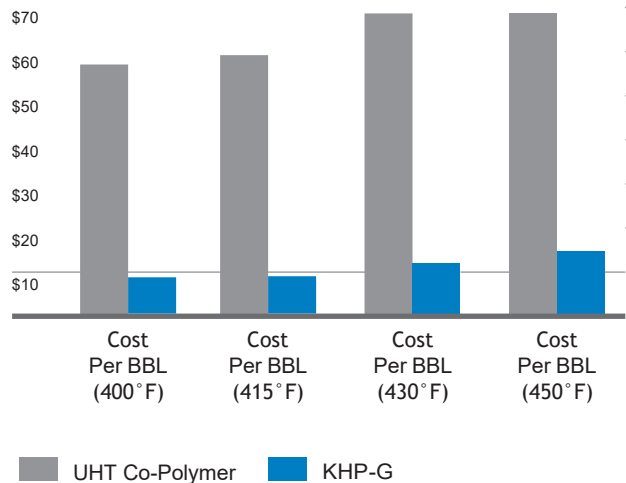
KHP-G has been proven safe and effective in more than 60 years of oilfield performance. With natural bonding and plugging properties and a high softening point, it is a cost-effective, multi-purpose additive.

- > Extends thermal life 10% or more
- > Prevents lost circulation
- > Minimizes differential sticking
- > Stabilizes shales
- > Performs in WBM and SBM
- > Performs in HP/HT environments
- > Reduces cost vs. polymers
- > Delivers higher performance with no HSE risk

KHP-G reduces costs more than 80%

KHP-G is a fraction of the cost of premium polymers. With its high softening point, it delivers greater cost advantages at higher temperatures.

KHP-G improves performance at a fraction of the price of synthetics alone.

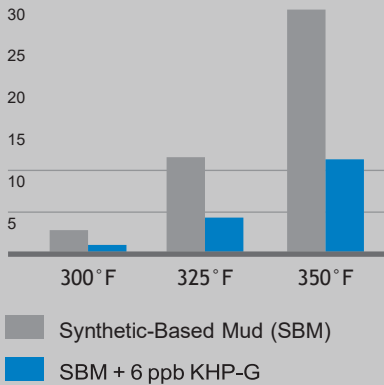


KHP-G extends thermal life

PALAYESH PARAFFIN KHAVARAN have yielded variations of uintaite with a range of softening points. Carefully selected varieties of pure Gilsonite® have been combined to perform to customers' specifications, at temperatures as high as 500°. Adding KHP-G extends the thermal life of synthetic-based mud and water-based mud formulations by 10% or more.

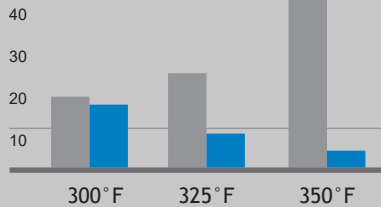
HT/HP Fluid Loss (ml)

Up to 66% reduction in fluid loss



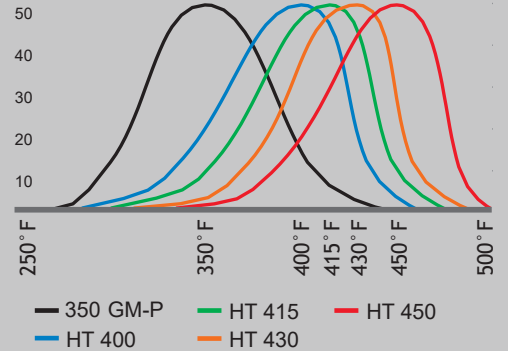
Particle Plugging Test (PPT) @2000 psi, 10 Microns Disk (ml)

Up to 91% improvement in particle plugging



High Softening Points (% Cumulative Particle)

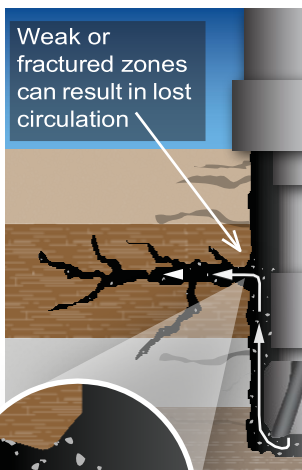
KHP-G products offer a variety of softening points to meet drilling requirements



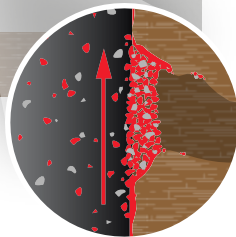
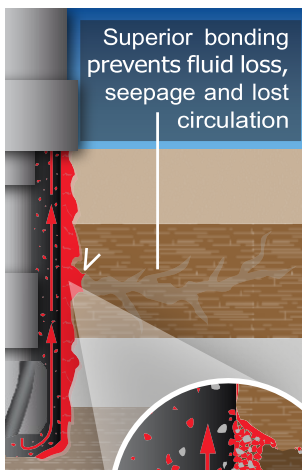
Unique bonding and plugging properties prevent formation damage

KHP-G forms a physical and chemical bond with permeable formations, creating an effective seal to prevent the passage of drilling fluid. By uniquely functioning as both a malleable and solid plugging agent, KHP-G controls fluid loss and seepage, prevents lost circulation and protects reactive and low-reactive shale surfaces, even at elevated bottomhole temperatures.

Without KHP-G



With KHP-G



A case history: KHP-G eliminates deepwater differential sticking

An international oil company drilling below 16,000 ft. in the Gulf of Mexico encountered a major pressure regression, and the pipe became differentially stuck. Unable to free the stuck pipe, the oil company and the drilling fluids provider decided to sidetrack the well, re-drilling the section with a zero fluid loss WBM.

Onsite testing indicated that sized particles and calcium carbonate in combination with high concentrations of KHP-G resulted in < 0.5 cc HPHT fluid loss, and fluid loss was nil as measured with a permeability plugging apparatus. Using the reformulated WBM, drilling proceeded through the major pressure regression without any sticking tendencies in the problematic wellbore. KHP-G is proven under pressure.

KHP-G is naturally better

KHP-G is a naturally occurring hydrocarbon resin found only in northeastern Utah. KHP-G has significant health advantages over synthetic products.

- > KHP-G is:
 - Non-toxic (unlike coal or fly ash)
 - Non-carcinogenic
 - Non-mutagenic
- > No extreme safety measures are needed to handle KHP-G

There's only one source of KHP-G.