

# POLAR-VIS

## Insulating packer fluid viscosifier

### APPLICATIONS

- Operations using ISOTHERM NT<sup>†</sup> advanced nonaqueous-base insulating packer fluid (IPF) in flowing temperatures up to 400 degF [204 degC]
- Well integrity operations
- Flow assurance operations
- Cost reduction for high operating expenses caused by active heating or chemical injection

### BENEFITS

- Decreases environmental impact by protecting Arctic permafrost from excessive thaw and preventing release of gas from gas hydrate deposits
- Improves well integrity by avoiding burst or collapsed casing from annular pressure buildup and by reducing material fatigue from thermal cycling
- Enhances production rates for heavy oil
- Increases production by reducing the frequency of remedial treatments caused by solids deposits
- Reduces cost by increasing flowing fluid temperatures for production and injection
- Decreases or prevents gas hydrate plug formation and paraffin buildup
- Reduces the potential for scale or salt deposits
- Improves the quality of steam delivered to the reservoir and reduces heating for export
- Increases subsea tieback radius before heating is necessary

### FEATURES

- Delivers in situ downhole fluid in cases where the fully yielded fluid would be too thick to pump
- Works with a wide range of base fluids
- Develops elevated low shear rate viscosity to control thermal convection
- Maintains stability to contamination from dilution

The POLAR-VIS<sup>†</sup> IPF viscosifier is a highly stable polymer designed for use in the ISOTHERM NT IPF. This unique synthetic polymer interacts with base oils to provide sufficient shear stress in the ISOTHERM NT IPF to control convection at temperatures up to 400 degF. Once fully yielded, POLAR-VIS viscosifier forms a stable micelle structure, resulting in a robust system that is highly tolerant to contamination. After achieving final rheology, the rheological properties remain the same for the useful life of the fluid.

### Physical Properties

Appearance	White powder
Odor	Odorless
Solubility in oil	Soluble
Relative density at 68 degF [20 degC]	0.88–0.91
Typical concentration	14–25 lbm/bbl [40–70 kg/m <sup>3</sup> ]

### Limitations

Pump thin fluid in applications with temperature above 250 degF [121 degC], and allow the POLAR-VIS viscosifier to yield in place to provide appropriate rheological properties at wellbore temperature.

### Toxicity and handling

Handle as an industrial chemical, wear protective equipment, and observe the precautions described in the material safety datasheet (MSDS).

### Packaging and storage

POLAR-VIS viscosifier is packaged in 40-lbm [18-kg] sacks. Store in a dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping, and stacking.